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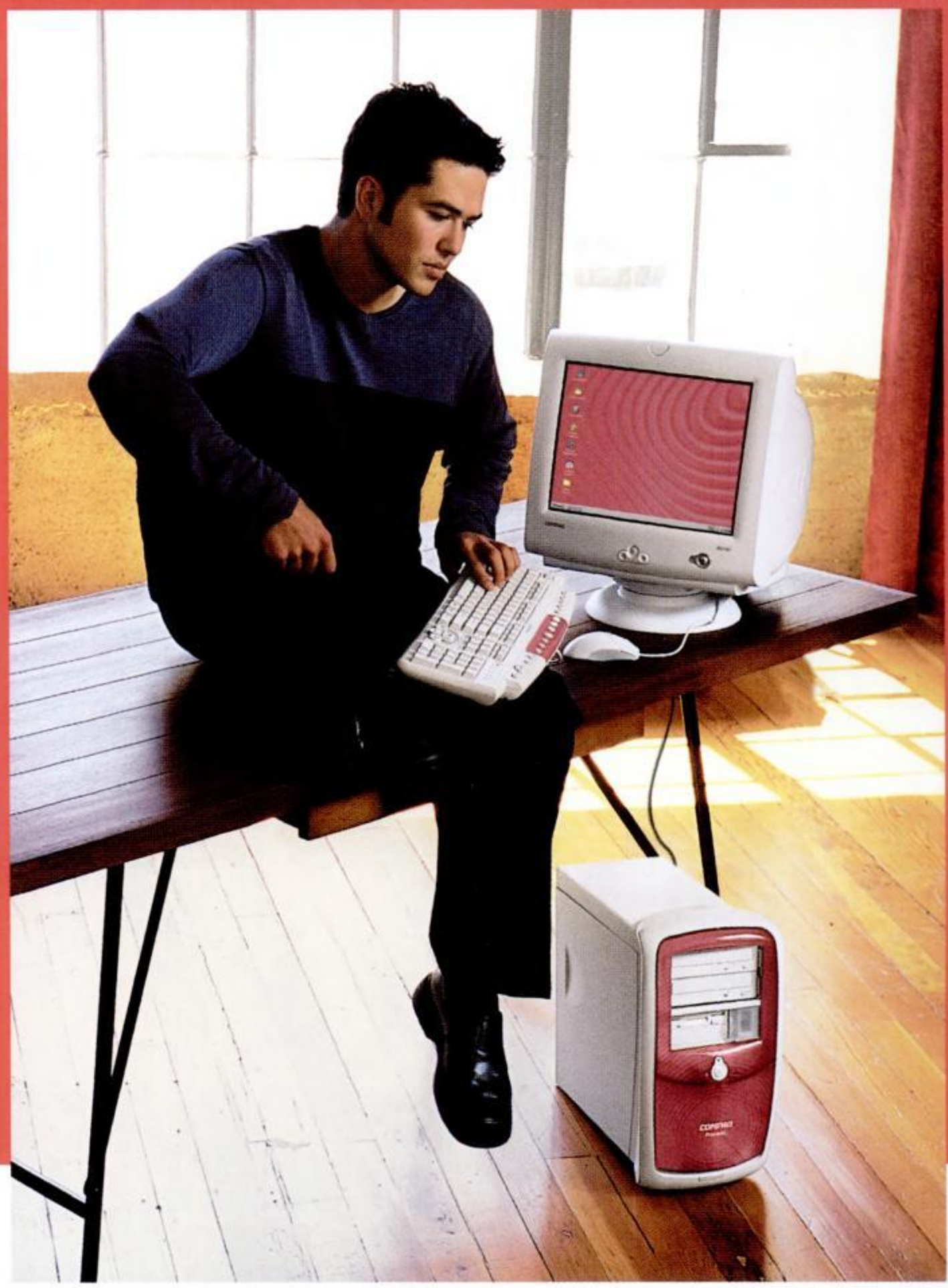

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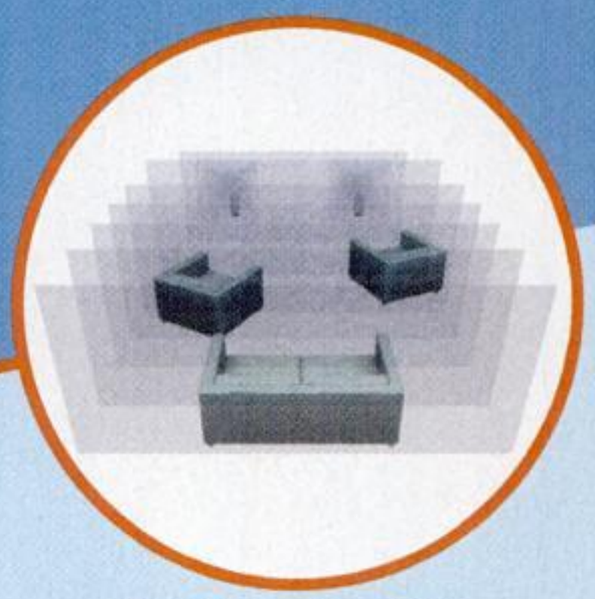

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Release Notes

Why nVidia Must Begin Selling Games

Imagine this TV ad: A 20-something proto-geek turns on his PC, and suddenly his monitor screen takes over your television screen with the most spectacular, eye-popping 3D graphics you've ever seen. Bullets whiz, cars crash, fists fly. Then a voiceover: "If you want the hottest 3D action game of the summer, you won't find it on a game console—Splatter Fest 2002 only plays on desktop PCs equipped with GeForce3s."

It's the Visa credit card approach—you can't buy a four-star meal in Park City, Utah if the only plastic you have is American Express. Nintendo did essentially the same thing when it launched the N64 console in tandem with *Super Mario 64*. If you wanted to play the awesome game, you had to buy the expensive console. I was one of many people drawn in by the *Super Mario 64* buzz. The graphics and gameplay looked too irresistible to pass up, so I made the necessary investment.

Now let's review the launch of the nVidia GeForce3 3D chipset, which is essentially a game platform in and of itself. The card hit market. Magazines and web sites went wild with praise. But most PC gamers reacted with indifference. And why should their response have been any different? None of the games available at its launch demanded the GeForce3's unique technology!

It's now six months later, and we still don't have a reason to buy the GeForce3. This is bad news for the PC industry, which relies on gaming, first and foremost, to drive sales. But what if nVidia had hired a dream team of game developers to design a must-have DirectX 8 title that would propel hardware sales during the GeForce3's launch? I'll tell you what—nVidia would now be in the middle of a six-month period of *insane* chipset sales. And the high-end desktop PC industry would likely be booming.

Granted, my wacky little plan is fraught with holes. Expensive software development might not be in nVidia's best interests, just like expensive hardware development wasn't in Sega and 3DO's best interests. And, of course, nVidia is doing just fine financially, so why muck with an already successful business plan? Nonetheless, it's time for the PC gaming hardware industry to get down and dirty. Maybe this means simultaneous software development. Maybe this means an aggressive, Visa-style marketing campaign when GeForce3 games finally launch. Either way, the PC industry needs a shot in the arm that only maverick technology developers such as nVidia can administer. The PC's very life depends on it.

—JON PHILLIPS

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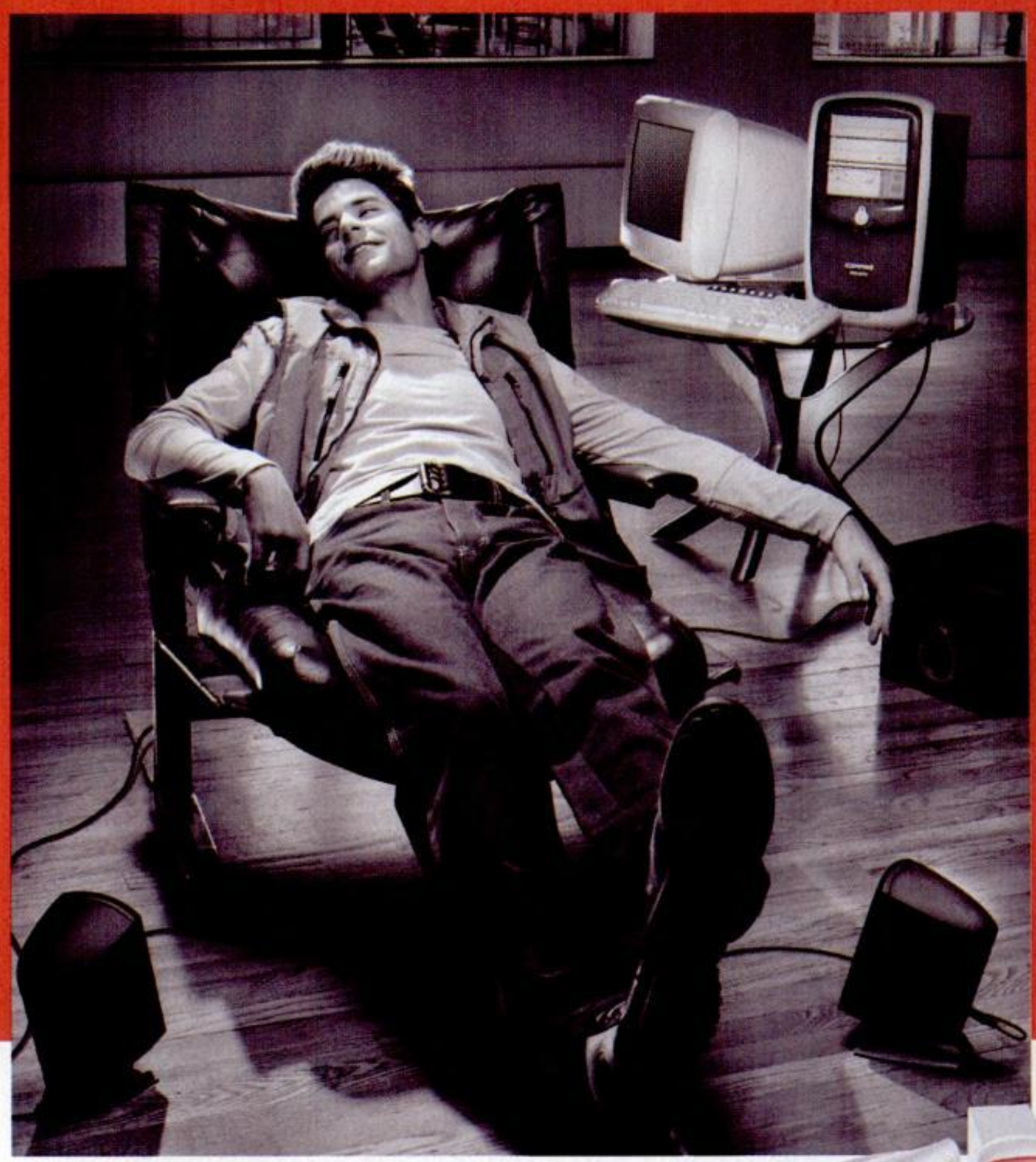

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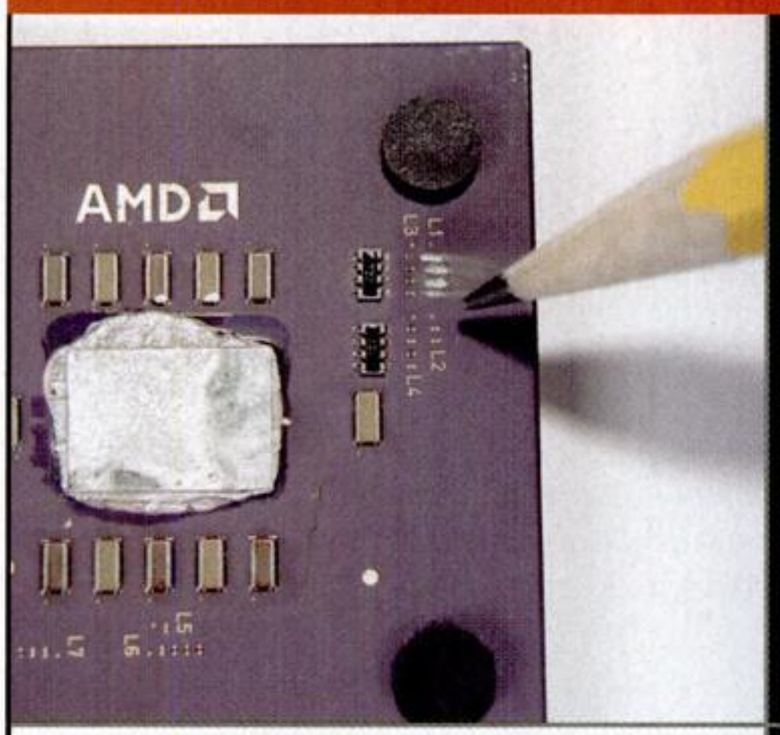
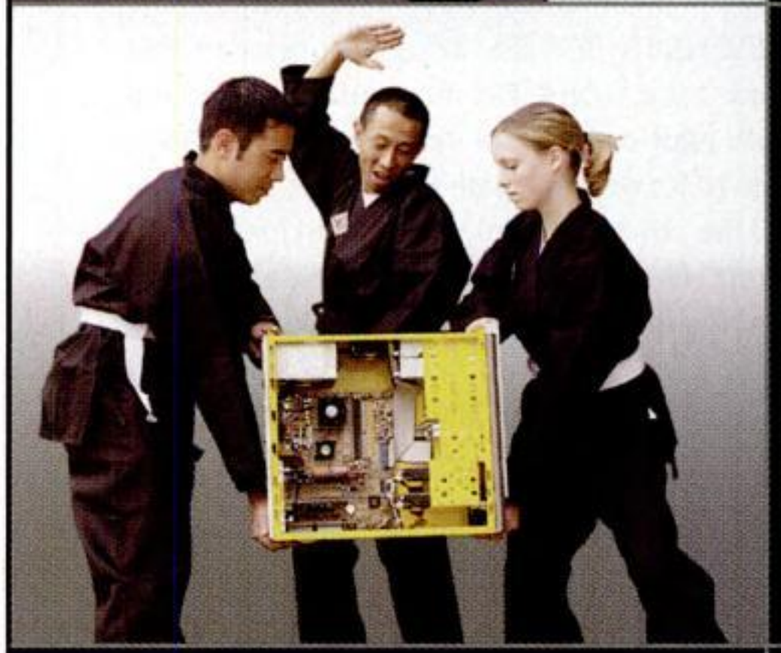


26 Secrets of the Power-User Elite
Maximum PC risked life and limb to bring you benchmark-boosting secrets from the vaults of hardcore PC users.



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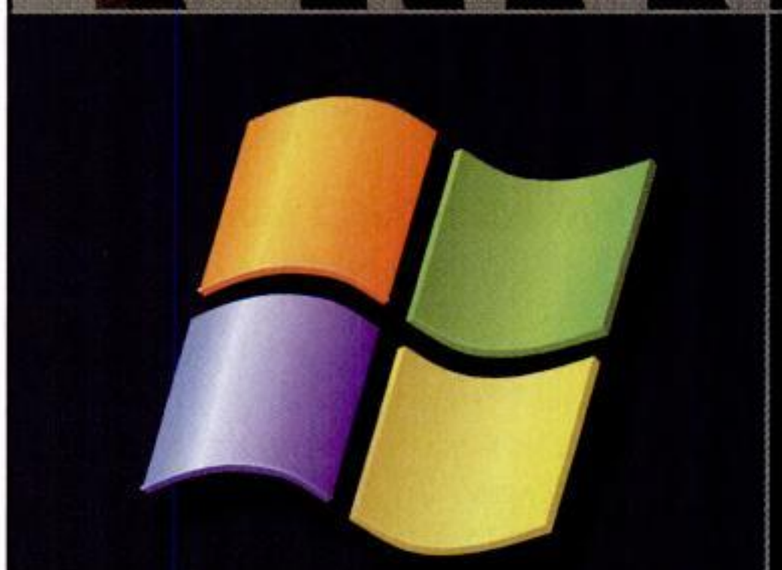
It's not magic that makes the insides of Voodoo PC cases so attractive and orderly. Meet the man responsible for Voodoo's interior aesthetic, and marvel at his masterpieces.



42 Windows XP
Will the new Microsoft OS change your life? Will it even meet your expectations? We fill you in on the 10 most important things you need to know about Windows XP.

48 Firewalls
If you lay awake at night worried that your PC will be overtaken by a teenage hacker and used for wrongdoing, or if you're simply concerned about ensuring data privacy and protection, our primer on hardware and software firewalls is for you.

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In/Out

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—DAVID BOHON

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MANAGING EDITOR KATHERINE STEVENSON REPLIES: I'm not convinced that plastic wrap would have helped in your case, David. The magazine you received bears all the tell-tale signs of an irate mail carrier: the crumpled countenance (no doubt from being strangled and buried for days beneath heavier, "more important" parcels); the shallow indents on the cover (certainly from being kicked and tread-upon with a comfortable walking shoe); and, if I'm not mistaken, human teeth marks along the tattered edge of the lower right corner (I suppose it's possible your mail carrier was just hungry).

I'll pass along your complaints to Customer Service, but I honestly think your beef is with a certain civil servant.

PLEASE, SIR, MAY I HAVE SOME MOBO?

I was wondering what you do with the Dream Machines (September 01) when you're done building them. It would be great if you gave them away in a drawing, because I am in desperate need of a new computer, and I'm only 14, so I can't get a job to earn money. But I understand if you don't want to give away more than $30,000 worth of computers.

—BRANDON USHER

EDITOR-IN-CHIEF JON PHILLIPS REPLIES: Brandon, if any reader ever deserved a Dream Machine, it would be you. Most readers write in with whiny pleas: "Can I have the Dream Machine? Can I have it, can I, can I, huh?" Others shout bold imperatives: "Give me your Dream Machine—now!" But not you, Brandon. You politely asked for not the Dream Machine itself, but rather an opportunity to win the Dream Machine in a random drawing. That's class, kid. I like the cut of your jib. You've got moxie, and it shows.

Unfortunately, we haven't given away the Dream Machine since 1998, and that experiment was a nightmare. The problem is that since the beginning of *Maximum PC* time, Dream Machines have been built from parts on loan from hardware vendors. Because they're not our parts, we can't give them away in good faith. And $30,000 worth of bad faith isn't something we want to incur.

MAY WE SUGGEST MORE FIBRE?

In your Dream Machines, why didn't you include 2Gb/sec fibre-channel hard drives such as the new Seagate drives? They have a much higher bandwidth rating than the drives you chose, and very fast seek times. I understand they're for high-end servers, but you already spent as much money as you could, so what's a little more?

—MATTHEW COOK

SENIOR EDITOR GORDON MAH UNG RESPONDS: As crazy as we were getting with the cost of the machines, we decided to practice *some* restraint. Truth be told, Ultra160 drives are more than sufficient for workstations; anything more would've been pure bravura.

I'M HAVING A TV EMERGENCY!

I just read the write-up of the nVidia Personal Cinema add-on card used in the Entertainment Center Dream Machine. I need one of these ASAP!

—JASON SCHLEIFER

TECHNICAL EDITOR WILL SMITH REPLIES: Personal Cinema-equipped cards should be shipping by the time you read this issue, but the Personal Cinema technology will only come bundled with full-featured graphics cards (and not as separate add-in cards). The GeForce2 MX, GeForce2 (regular, Pro, and Ultra), and GeForce3 all support the Personal Cinema. The Personal Cinema should add around $50 to the total cost of a board. At press time, no vendors had yet been announced. Of course, we'll review Personal Cinema-equipped videocards as soon as they're available.

MINE IS BETTER THAN YOURS

The Ultimate Gaming Rig tallied in at around $6,000 and posted a *3DMark2001* score of over 6600. The rig uses a 2GHz-plus CPU from Intel. In other words, $6,000 plus 2GHz equals a score of 6600. My dilemma is that my humble little overclocking project cost around $1,600, has just a 1.5GHz-plus AMD CPU, and the same video chipset (but a different brand card), and I got a *3DMark2001* score of over 6500. That's just about 100 points lower than that of the Dream Machine. I fail to see how my machine can cost $4,000 less and lose by such a small margin. The

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only thing I can see that might be faster on my system is that my Geforce3 is clocked at 240/267.5.

—MATT WERKING

SENIOR EDITOR GORDON MAH UNG RESPONDS: Don't be confused, Matt. *3DMark2001* is primarily a videocard benchmark. CPU performance is simply less profound in this one test. A Thunderbird Athlon overclocked to 1.5GHz is very competitive with a 1.8GHz P4 overclocked to 2GHz. Your own *3DMark 2001* score is so very close to our score because you've dangerously overclocked your GeForce3. I actually doubt your card will live very long at that speed, and I have doubts about its stability (unless serious cooling hacks are applied).

Because I'm sensing sarcasm in your letter, I'll have to set the record straight: Our Ultimate Gaming Rig isn't housed in a $42 pot-metal case picked up in the "scratch and dent" section of Wal-Mart. We're not running it with a used Packard Bell 15-inch monitor with a bubble in the middle. We're not using a pair of 1989 Labtec speakers that run on D-cell batteries. Our Dream Machine's monitor alone costs more than your entire system. Our PC Power and Cooling power supply is quiet, puts out 400 reliable watts, and won't eventually make your motherboard go snap, crackle, and pop. Our Klipsch 5.1 speakers are, well, they're Klipsch 5.1 speakers. These parts and much, much more raised the cost of our gaming machine to $5,712.

SOUNDING OFF

This is in reference to your "MP3 Survival Guide" (September 01). Something that gets on my nerves is the increasing number of people who believe that MP3 files encoded at 128Kbps are of listenable quality. Almost anything under192Kbps is just awful, especially if any percussion with cymbals is present. Now, while the 64Kbps MP3Pro format is far superior to a 128Kbps MP3, artifacts are still present. I know that MP3Pro is still in development, and eventually, according to Coding Technologies, encoding will be available up to 128Kbps. But I want to know why there aren't plans for a higher bitrate. As a musician, I love what the MP3 format has done to help expose virtual unknowns to the world, but I'll be damned if I'm going to listen to what sounds like an eighth-generation copy—analog, of course.

—KIRKWOOD DEAL

REVIEWS EDITOR ROB PRATT REPLIES: I agree with you about the poor quality of MP3s encoded at bitrates lower than 192Kbps. But should MP3Pro be available at bitrates above 128Kbps? That's a question for a marketing guru. As far as our ears are concerned, MP3Pro at a bitrate of 64Kbps offers audio quality superior to regular-old MP3s encoded at 128Kbps, but not as good as MP3s at 192Kbps. Ultimately, neither MP3 nor MP3Pro will ever produce the quality of CD audio, since both are lossy compression formats prone to producing artifacts. Don't want to put up with artifacts? Then play your favorite music directly from the CD. If you want to stream audio over the Internet or load hours of music onto a portable player, however, you'll have to trade a little bit of audio quality for the convenience of MP3, MP3Pro, or another audio-compression format.

MEMORY MISUNDERSTANDING

Who wrote the Fun-Size News in the August issue? I think a retraction is necessary. RDRAM does not run at an 800MHz frontside bus (FSB), but at a 100MHz FSB (100MHz clocked at four cycles per second). The 800 in PC800 refers to theoretical throughput in megabytes per second. And [RDRAM] running at 1200MHz? Damn! I only wish FSB was clocked at that speed. Let me know if I'm wrong, so I can put on my dunce hat, like Dick.

—ISAAC

SENIOR EDITOR GORDON MAH UNG REPLIES: Our wee article doesn't refer to the RDRAM's frontside bus speed (which, by the way, is 400MHz, i.e., a 100MHz quad-pumped bus). We wrote: "By upping today's RDRAM speeds from a 16-bit interface at 800MHz to a 64-bit interface at 1200MHz..." Also, you're wrong in stating that the 800 stands for theoretical throughput. 800MHz is the internal clock speed of RDRAM. At 800MHz, RDRAM's throughout is about 1.6GB/sec.

The real baloney is in the way PC1600 and PC2100 are named. Since PC200 and PC266 sound less impressive than PC800 or even PC600, the memories were named for their theoretical bandwidth. This is just plain misleading. PC100 and PC133 refer to memory clock speed. PC600 and PC800 refer to *internal* clocks, but clock speed, nonetheless.

When talking about RDRAM, interface width is arguably more important than clock speed. Jumping from a very narrow 16-bit to a 32-bit or 64-bit interface yields an incredible amount of speed. Of course, it's anyone's guess as to whether Intel will even support RDRAM much past next year.

BARRIER BUSTERS

In the article "IDE Barrier Stops PCs..." (September 01) you refer to the 137GB barrier for IDE hard drives. Does this affect the size of volumes created when striping with an IDE RAID controller? I have two 75GB IBM hard drives; is it possible to successfully stripe them to create a 150GB volume.

—DAN EDMONDS

REVIEWS EDITOR ROB PRATT REPLIES: You shouldn't have a problem building a 150GB volume from two 75GB drives. Even though a striped IDE RAID array looks like a single physical drive to your PC, the RAID controller sorts out some of the addressing limitations that cause the 137GB barrier. Channel Marketing Manager Craig Lyons of Promise Technologies told us that his company's IDE RAID cards (and, in fact, most IDE RAID controllers) perform this neat trick for hard drives up to 137GB. In other words, a RAID card supporting four drives could stripe them together for a maximum volume of 548GB (137 x 4).

PUBLIC SERVICE ANNOUNCEMENT

In the "How To Be Your Own Technical Support Specialist" (September 01), Norbert Matthews failed to mention a fantastic web site that offers free, accurate, fast, and polite help, no strings attached: **www.protonic.com**. Check it out. With more than 600 volunteer technicians, more than 26,000 answered questions, and a mentoring system to ensure courtesy, professionalism, and accuracy of each answer, it puts the newsgroups to shame.

—CAREY HOLZMAN

AMAZING GRACE

I enjoy reading your magazine immensely, and I find some of the articles to be quite intriguing and very inspiring. However, after being involved in the computer industry

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for quite a while, I was very disgruntled to see you diminishing one of my heroes: Admiral Grace Hopper (Quick Start, August 01). She was one of two women named fellow of the Institute of Electrical and Electronics Engineers, and she won IEEE's McDowell Award in 1979. Grace Hopper was appointed Rear Admiral in 1985. And when she retired from the Navy in 1986, she was the nation's oldest military officer on active duty. After her retirement from the Navy, she accepted a position with Digital Equipment Corporation as senior consultant, where she remained until her death in 1991. She was the first individual to receive the National Medal of Technology. She continued receiving honors even after her death. In 1994, she was inducted into the National Women's Hall of Fame, and the Navy announced it would name a guided missile destroyer U.S.S. Hopper.

Grace Hopper was an actual ranking Admiral, deserving of the utmost respect. Her contributions to the computing industry are still felt today.

—JEFF STANTON, GSM1(SW) RET. USN

CUT, COPY, PASTE

■ **A layout error caused a trio of typos in the specs box that accompanied the review of a Dell Dimension 8100 system (September 2001). The Dell system included an NEC CD burner, an NEC DVD-ROM, and a Maxtor DiamondMax Plus hard drive (as the review's main text indicated), not the HP CD burner, Toshiba DVD-ROM, and IBM Deskstar hard drive listed in the specs.**

■ **The audio breakout box showdown that ran in the Head2Head section in the September 2001 issue incorrectly listed the USB hub installation procedure for the Hercules Game Theater XP. The USB jumper only requires a connection at the back of the PC where the soundcard is installed, and not an additional USB connection to the XP's breakout box.**

■ **A correction in the September 2001 issue was incorrect. Satellite speakers should have frequency response *from as low as* 200 to 250Hz (the upper end would likely be in the vicinity of 20KHz), not a frequency response *of* 200 to 250Hz.**

■ **In last month's Dream Machine feature, a couple of numbers in the benchmark chart for the Entertainment Center were reversed. The system was able to record 42.2 hours of hi-quality television and 156.1 hours of low-quality T.V., not the other way around.**

■ **We misprinted the URL for the Tyan Thunder K7 mobo featured in the Content Creation Dream Machine. The correct URL is www.tyan.com.**

LETTERS POLICY: MAXIMUM PC invites your thoughts and comments. Send them to input@maximumpc.com. Please include your full name, town, and telephone number. Letters may be edited for space and clarity. Due to the vast amount of e-mail we receive, we cannot personally respond to each letter.

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SpecSpeak Redux

The "Spec Speak" article in the August issue was, in most respects, an excellent piece. However, there was one glaring omission: There was no section on motherboards! What were you thinking? The mobo is the basis of the whole machine, like the foundation of a house, and there are so many sockets attached! What is an AMR? What is a CNR? Are they necessary? Valuable? Is there an advantage to having audio built in to the board? Is there an advantage to having a slot as opposed to a socket?

See what I mean? The piece was good but incomplete.

—JIM ALFORD

SENIOR EDITOR GORDON MAH UNG RESPONDS: You make a great point, Jim, but it seems you're looking for a buyer's guide rather than an explanation of the specs that typically appear on motherboard boxes. Regardless, we aim to please, so here are the answers to your questions, followed by the "missing" guide to motherboard specs.

AMR stands for audio-modem riser slot, and for all intents and purposes, it's nothing more than a physical interface for speaker and phone cabling. You'll need to fill this slot with an AMR card if you have any intention of leveraging the rudimentary audio and modem processing functions built into your motherboard's chipset. In real-world use, you plug the AMR card into your mobo, enable the mobo's audio and modem functionality through Device Manager, then plug your speaker wire and phone line into the AMR card. Just remember that the modem and audio functionality built into most motherboard chipsets royally sucks—it's just passable from a sheer quality standpoint, and it can eat up your system resources. CNR stands for communication and networking riser, Intel's replacement for AMR. CNR handles audio and modem cabling, but also facilitates network cabling and multi-channel audio.

Slot-based CPU motherboard connectors don't offer any performance benefits over socket-based CPU connectors, though slot-based CPUs do tend to be more rugged, what with their protective plastic exoskeletons. Slot-based connectors are indeed more "electrically complex," but this complexity doesn't affect actual CPU performance. Regardless, slots are dead. Slots were only introduced in the first place because, in 1997, CPU process technology wasn't sufficiently advanced to integrate L2 cache directly in the CPU chip itself. So L2 cache was instead "closely coupled"—it sat beside the CPU chip on a common daughtercard, which was then inserted into the motherboard slot. But by 1999, process technology had advanced to the point where L2 cache could be directly integrated into the CPU die, and thus the "Coppermine" P-III and "Thunderbird" Athlon ditched the slotted daughtercard approach and moved back to basic, square-shaped sockets.

And with that, we move to an explanation of the specs you'll actually find listed on a typical motherboard box. For this example, we grabbed the actual specs printed on a Soyo SY-K7V Dragon box...

1 Processor: Supports AMD Socket-A type processor

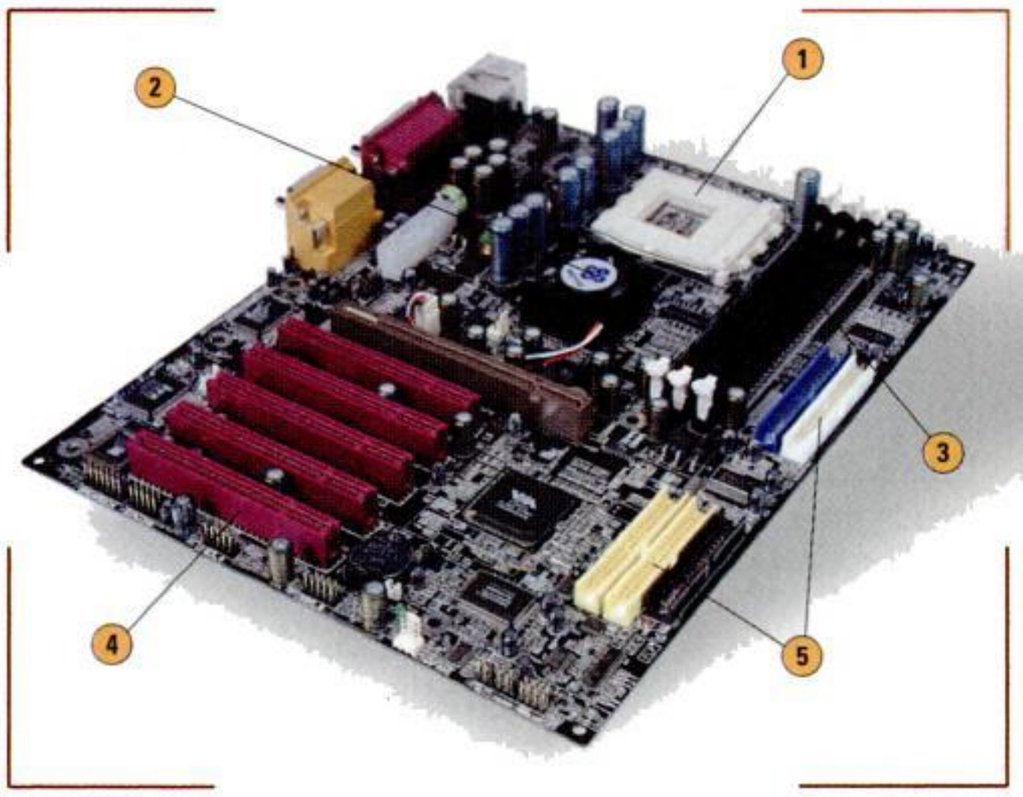
This spec, of course, defines what type of processor you can plug into your motherboard. This Soyo mobo sports a Socket A interface, which supports all Thunderbird Athlon and Duron processors.

2 Chipset: VIA KT266 (8266 / 8233) chipsets, supports 200/266 MHz FSB

The chipset is the most important component of any motherboard and essentially functions as an air-traffic controller for all the data that travels through the board's various buses. This Soyo board boasts VIA's Apollo KT266 chipset, which supports all modern AMD processors. The packaging even goes so far as to identify the chipset's two separate northbridge and southbridge chips (8266 and 8233). The northbridge chip controls memory and AGP graphics, and communicates directly with the CPU. The southbridge controls the PCI slots; the serial, parallel, and USB ports; and IDE drives. FSB stands for frontside bus. In this case, the board's chipset-to-CPU channel can run at either 200MHz or 266MHz. This speed rating shouldn't be confused with how fast the motherboard communicates with memory, as some systems use different speeds.

3 System memory: Three 184-pin DDR SDRAM 2.5V DIMM, supports up to 3GB of PC2100 memory

This motherboard supports DDR SDRAM memory, which communicates on the rising and falling edges of the memory clock and thus doubles the speed of normal PC133 memory. The 184-pin reference reminds you what type of memory module to buy, while 2.5V defines the memory's power requirements. The 3GB spec refers to the maximum amount of memory the motherboard can support. PC2100 refers to the 2.1GB/sec theoretical bandwidth of DDR memory.



Disclaimer: This information is subject to change without notice. A few early Athlon motherboards claimed they could support processors up to 1.5GHz. But due to changes made by AMD, those marketing claims turned out to be false. False advertising? No. Nonetheless, motherboard boxes now clearly state that specs may change without warning. Doh!

4 Expansion slots: Five 32-bit Bus Mastering PCI slots, one Universal AGP Pro slot, supports 1x/2x/4x modes

Five 32-bit/33MHz PCI slots is the standard configuration of the typical, modern, desktop motherboard (motherboards aimed at the workstation/server market support 64-bit /66MHz PCI slots). Bus mastering is a technology that allows PCI devices to communicate with other devices without first tapping the CPU; this approach saves precious CPU cycles. The 1x/2x/4x AGP mode designation refers to how fast the AGP card can transfer data. All modern motherboards should support 4x modes.

5 Ultra DMA IDE ports: Four independent channels for eight IDE devices (two for RAID)

Almost all motherboard chipsets offer native support for four IDE devices. The Soyo SY-K7V Dragon, like many enthusiast motherboards, embeds a RAID chip from Promise Technology to let you run IDE RAID in either stripped or mirrored configurations. ■

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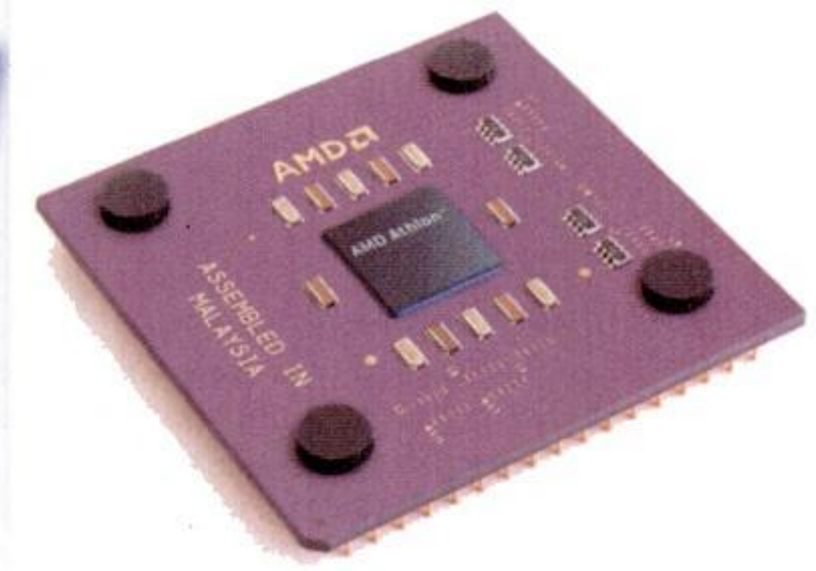
Quick Start

The beginning of the magazine, where articles are small

IT'S ON—IT'S *SO* FRIGGIN ON

CPU Wars

AMD and Intel go to the mattresses—again



It's war in Silicon Valley, and this time it's personal. AMD and Intel are out to pull each other asunder once and for all. Here's what to expect on the CPU front between now and next summer.

Intel

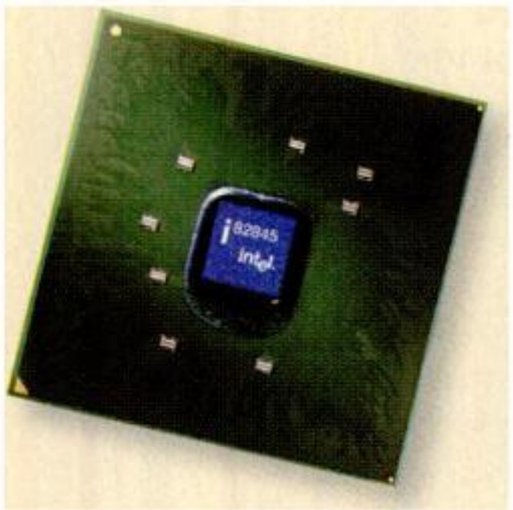
Intel lost the race to 1GHz, but by the time you read this, it should already have taken the 2GHz crown with the release of its fastest Pentium 4. This victory suggests that Intel's risky pipelining strategy may finally be paying off. Indeed, the same super-long pipeline that impairs basic Windows application performance is also allowing Intel to ratchet up clock frequencies past 2GHz. Does the extra clock speed mitigate the performance hits incurred during the pipeline's branch misprediction? The answer is actually quite irrelevant: Most consumers simply buy the fastest-clocked proc possible, actual performance be damned.

With a more efficient 0.13-micron process on tap, Intel is expected to introduce 2.2GHz P4s late this year, and to hit 2.5GHz by next summer. By the end of 2002, the P4 could creep up to the 3GHz mark. Intel is also expected to retire the desktop version of the Pentium III in 2002. Celeron will continue to occupy the bottom strata of the CPU market, but for all intents and purposes, it will be nothing more than a renamed P-III.

AMD

There's no arguing who has been in the leadership position for the last 18 months. Ever since it hit the scene two years ago, AMD's Athlon has roughed up the P-III and P4 like a sand-kicking beach bully. The big question for 2002 is whether AMD can keep up as the P4 breaks 2GHz and approaches 3GHz. AMD's immediate answer to the Intel problem is the next-gen desktop Athlon (which is still codenamed Palomino).

The skinny is already out on the Athlon MP (a server proc) and Athlon 4 (mobile), but AMD remains mum on the desktop Palo'. Nonetheless, everyone expects this CPU to intro at 1.5GHz and climb upward from there. While enthusiasts know that Athlons can offer better performance than Pentium 4s running several-hundred megahertz faster, the average consumer still believes clock speed is always king, no ifs, ands, or buts. Our prediction? AMD will begin spreading an Apple-like "megahertz doesn't matter" message. Yikes!



The Intel 845 will be the first Pentium 4 chipset to support regular-old SDRAM.

Chips and Dips

Tasty options abound at the P4 chipset buffet

Looking for more Pentium 4 chipset options? Your wait will soon be over. This fall, a full line-up of chipsets is expected to join the Intel 850 in support of the Pentium 4 processor. Here's a rundown of the top contenders.

Intel 845: Intel's first non-RDRAM chipset for the P4 will support up to 3GB of PC133 memory and include a host of features to keep the SDRAM well fed. Intel's own numbers show the 845 to perform competitively with the RDRAM-only 850 in non-bandwidth intensive tests. Internally, the bandwidth between the north and southbridges will continue to be 266MB/sec. Although conventional wisdom has it that Intel's DDR support is ready, the company says it won't offer DDR compatibility until early next year.

Silicon Integrated Systems SiS645: Long banned from power-users' boxes, SiS's new SiS645 chipset promises to bring DDR333 to the Pentium 4. DDR333 is essentially double-clocked 166MHz memory. (It's also the sequel to PC2100.) The SiS645 will support up to 3GB of PC1600, PC2100, DDR333, or PC133 memory. The chipset will also feature a high-speed interconnect with twice the bandwidth of Intel's.

VIA P4X266: VIA's lack of a license to build chipsets for the P4 won't stop it from selling the P4X266 this fall. This chipset will offer up to 4GB of PC1600, PC2100, or PC133 support, a high-speed V-Link interface comparable to Intel's Hub Architecture, and three USB controllers instead of the usual two that most chipset vendors are offering.

ALi: At press time, ALi was the cagiest of the chipset vendors and would only say that it will have a DDR Pentium 4 chipset out "sometime soon." We can guess what it'll offer, however: PC133, PC2100, and DDR333 support, as well as AMD's HyperTransport technology. That's just a guess, though, folks.

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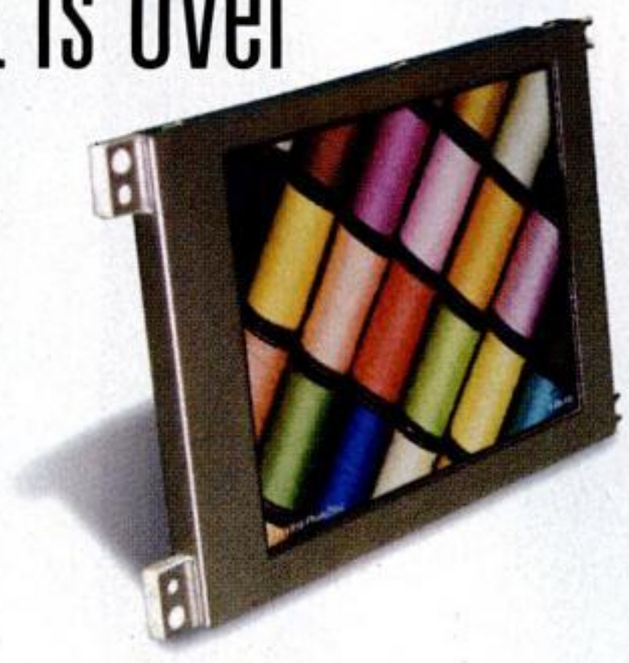
TECHNOLOGY REPORT

ThinCRT: The Wait is Over



It's been about two years since readers first began harassing us for a review of Candescent's ThinCRT technology. And it's been about two years since we first began telling readers that the display technology wasn't ready for prime time and they'd just have to wait.

Well, it appears the wait is finally coming to an end. Candescent has announced its first partner. Kaga Electronics will use 5.3-inch ThinCRTs in its automotive display products for the Japanese market (think dash-mounted street navigation systems and rear-seat DVD screens for the kiddies). Instead of using the typical bell-shaped CRT tube, ThinCRT uses a flat tube about 10mm thick. Each pixel is lit by thousands of tiny emitters instead of a single, large cathode gun. Candescent says ThinCRTs will be cheaper to produce than flat-screen LCDs and will offer superior brightness, sharpness, pixel response, and off-axis viewing. For an online white paper, go to **www.candescent.com**.

And how long before ThinCRT hits the PC desktop? A Candescent rep told us "possibly" within 18 to 24 months.

Good Worm, Bad Worm

Not all computer viruses pose the same threats

In all likelihood, TV news reports about computer worms have your parents so terrified, they won't even read your e-mail. But how often has genuine worm-related chaos lived up to worm-related hype?

Code Red/Code Red II

By exploiting holes in Microsoft's IIS web server software, "Gusano rojo" automatically launched denial-of-service attacks on the White House.

Hype: Scary press over an "attack" on the White House had tech-newbies dusting off their 1950s bomb shelters.

Reality: No civilians were injured. But the cyber-damage might have been far worse if the worm didn't have a bug in it that caused it to lose steam as servers were patched.

SirCam

Besides deleting files and crashing hard drives, SirCam's most destructive feature was its ability to grab documents from users' My Documents folders, then e-mail them around the world.

Hype: Minimal. Too minimal, in fact.

Reality: Caught up in Code Red hysteria, the media blew their chance to warn people of the real threat—SirCam.

ILoveYou/Loveletter/Lovebug

There was no love in this macro virus, which renamed and hid MP3 files and replicated itself using a scripting bug in Microsoft *Outlook*.

Hype: The media went crazy with advisories and tales of widespread damage.

Reality: Lovebug affected millions of computers, but probably didn't incur $2.5 billion in damages, which some media reported. After all, the 1993 storm of the century shut down the East Coast and killed 243, but incurred only $3 billion in damages.

FAST FORWARD BY TOM R. HALFHILL

Intel Assimilates Alpha

Another Intel challenger has surrendered. Compaq's famous but unpopular Alpha microprocessors—acquired from Digital in 1998—will be phased out by 2003. Quick to reap the spoils of war, Intel has snapped up some radical Alpha technology that could lead to much faster Pentiums.

This is hardly a surprise ending. Digital launched the 64-bit Alpha RISC architecture in 1992 as a direct challenge to Intel and other rivals. The Alpha won fame as a "speed demon" because it consistently reached higher clock speeds than any other microprocessor. But Compaq had no experience designing or marketing microprocessors, and it was already using MIPS and Intel CPUs in its servers. When Compaq adopted Alpha, it seemed like Mother Teresa adopting Britney Spears—a cool addition to the family, but not exactly a match made in heaven.

Now Intel is assimilating Alpha. That includes the Alpha CPU and compiler technology, design tools, and even people. Hundreds of Alpha engineers are being offered jobs at Intel. *Resistance is futile!*

The obvious winner is Intel's high-end IA-64 architecture for servers and workstations. But future Pentiums also have something to gain: a radical technology called simultaneous multitasking (SMT).

SMT was scheduled to appear in 2003 in the Alpha 21464, now stillborn. The idea of SMT is to mix instructions from different threads or programs (known as "processes") together in the same CPU pipeline. Normally, a pipeline executes an instruction stream from a single process at a time, just as a factory assembly line manufactures one type of vehicle at a time. The CPU must flush old instructions from its pipeline whenever a new process needs execution time.

Imagine a factory that mixes cars, pickup trucks, and SUVs together on the same assembly line. It would rarely be idle because it could adapt instantly to changing customer demands. Likewise, an SMT pipeline maximizes a CPU's resources by mixing instructions from different processes together, without flushing the pipeline each time.

Press Ctrl-Alt-Del on a Windows PC to view how many processes are running. That list doesn't include low-level threads within multithreaded programs. Now consider that a Pentium 4 has a pipeline more than 20 stages long, which means the CPU must flush about 20 instructions every time it switches processes—which can happen many times per second.

That's why I think Intel will use SMT in future Pentiums as well as in IA-64 microprocessors. Assimilating the Alpha should make the job much easier.

Tom Halfhill was formerly a senior editor for Byte *magazine and an analyst for* Microprocessor Report. *He is now a technical writer/analyst in Silicon Valley.*

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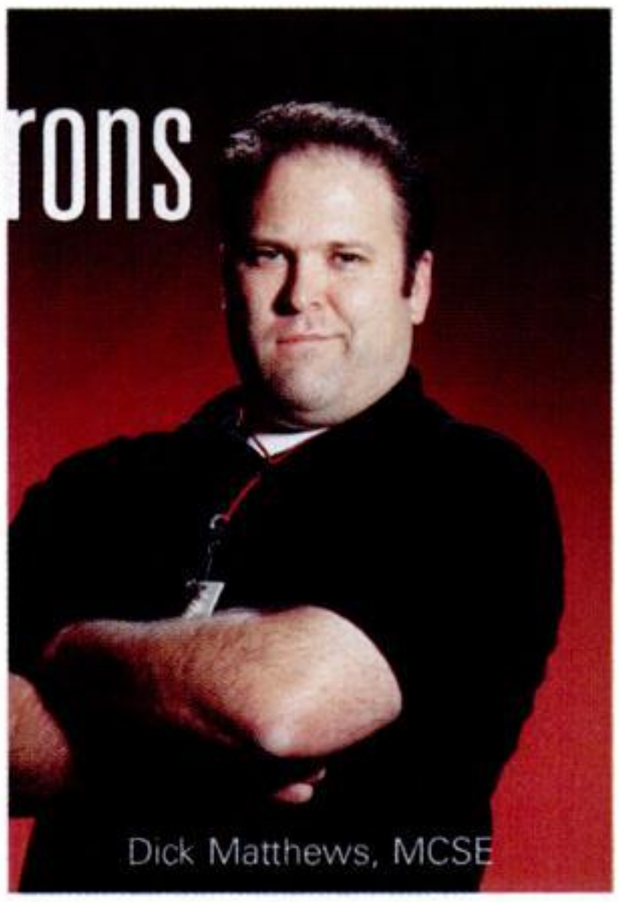
HELPFUL HINTS

Windows Tips for Morons

The Operative Word is "Moron"


Dick Matthews, MCSE

That half-wit Phillips said that if I want to continue writing my column for his stinking magazine, I'd better come up with some sort of theme to help entertain you pin-heads—as if my sage advice and witty wisdom aren't enough. So my theme this month is "Jon Phillips Sucks." Entertaining? I love being me.

I also love Linux. While it lacks the polish and stability of WinNT, I like having virtual desktops, so I can keep all my apps open but separated by type on different virtual desktops. This makes switching between running apps orderly and efficient. The bad news for King Dick is that Windows doesn't include any option for virtual desktops.

This is where *Desktop Plus* comes in. For a mere $20, I can get virtual desktops, just like with Linux, on almost all versions of Windows (Win95 isn't supported because Win95 users are idiots who shouldn't be messing with powerful OSes).

My next magic trick is to create a shortcut to Device Manager, which should save you thousands of clicks when adding illicit hardware and tinkering with beta drivers. The instructions are different for Windows 2000 and Windows 9x users, so listen up.

■ Windows 95/98/ME: You Windows 9x pukes just need to create a shortcut that points to the following: **c:\windows\system32\Control.exe sysdm.cpl, system,2**. You can name it anything, but I'd suggest, "My mommy still picks out my clothes for me."

■ Windows 2000: All you semi-hardcore, Win2K poseurs can create a shortcut to **c:\winnt\system32\mmc.exe c:\winnt\system32\devmgmt.msc** (that's all on one line, kiddies) if you installed 2000 in c:\winnt. Name it, "I'm a stinky little boy and don't deserve to have this shortcut."

I've got one last pearl of wisdom for all you fancy lads: If you're so inept that you can't recover data from a bad CD, try using *CD-R Diagnostic*. I've used it for years to retrieve files from faulty CD-Rs burned by power losers.

That's it for this month, folks. Next time we'll discuss Jon Phillips' stupid hair.

The idiot forgot to add the URL. It's www.desktopplus.com

Isn't this the app that Logan recommended to Dick last time he was up here, begging for advice?

Dick is stinky, and his mom picks out his clothes? Where'd this schmuck learn to write, Rangoon?

Viewing History through a Bilinear Filter

What if historical events were re-rendered through the isometric perspective used in games like *The Sims* and *Diablo*? Well, we no longer need to wonder. Artist Jon Haddock has illustrated 20 pivotal events—such as the Rodney King beating, the Columbine shootings, and the assassination of Martin Luther King Jr.—in unnerving 3D detail. Haddock's work has been on display around the country, and can now be viewed at **www.whitelead.com/jrh/screenshots/**. We find his art unsettling, but undeniably gripping.

Clockwise from top left: Wang Weilin faces down tanks in Tiananmen Square; Jack Ruby murders Lee Harvey Oswald in the Dallas Police Department parking garage; Buddhist monk Thich Quang Duc commits self-immolation to protest the Vietnam War.

FUN-SIZE NEWS

No Cuts, Kid

Why wait in line for movie tickets when you can print your own? Two Tucson, Arizona theaters have begun test trials of Fandago.com's new system, which lets people buy and then print their own movie tickets. To ensure that someone won't print 10,000 tickets, the system issues each customer a unique, bar-coded ticket that's scanned as he or she enters the theater.

Fastest Computer Goes Online

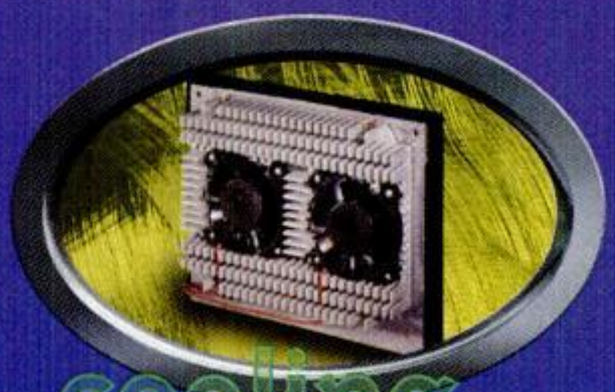
ASCI White, the most powerful supercomputer on the planet, is now online and crunching mind-numbing calculations to ensure that our nukes work properly. Housed at the Lawrence Livermore Labs in California, the computer has 8,192 CPUs and enough hard-disk space to hold 300,000,000 books. The system has been in place since early this year, but just began crunching real scientific data in August.

Palm Buys Be

Might future Palm PDAs run an OS-based on the Be operating system? Could be. Could be, indeed. Palm Computing scooped up the troubled OS company for a piddling $11 million this summer. One can only assume that some Be code will end up in future devices, to compete against Microsoft's Pocket PC.

No Java for you!

Sun, which once filed suit to keep Microsoft from shipping a proprietary version of Java in Windows, now says it wants Microsoft to support Java. Sun sued Microsoft in 1997, claiming its Java version was flawed. Microsoft counter-sued, saying its version was simply better. After settling that suit this year, Sun is now launching a very public campaign to compel Microsoft to include Java in Windows XP.



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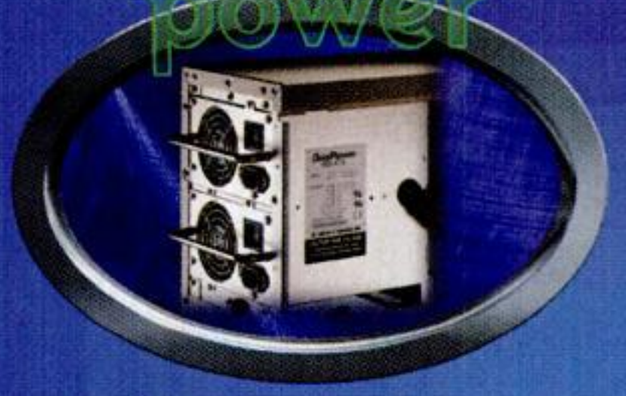

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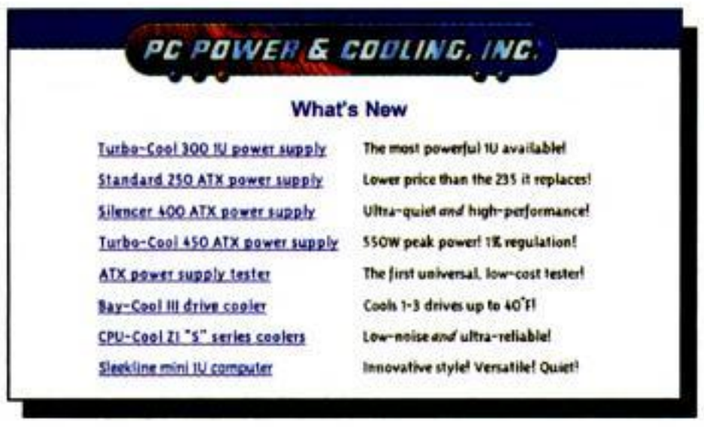
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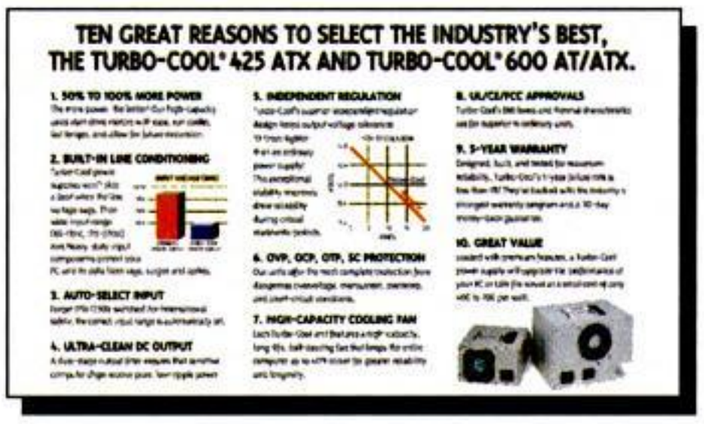
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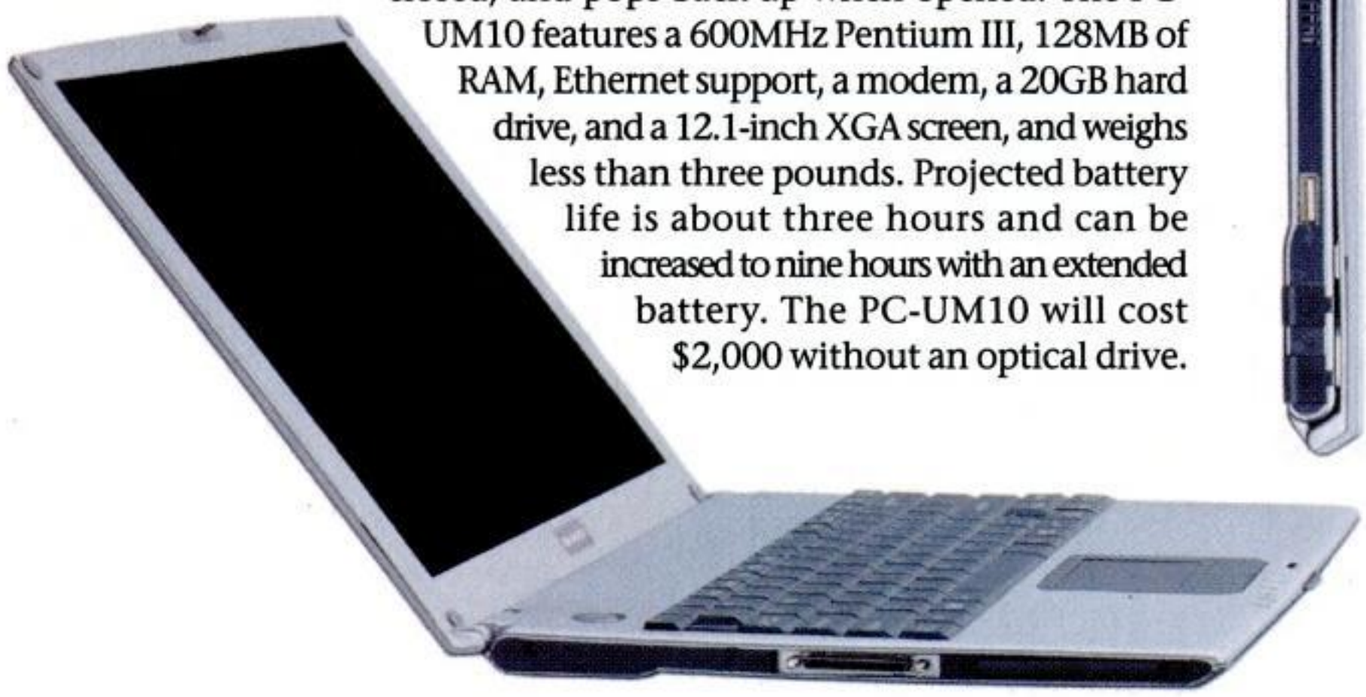
So Thin, It's Downright Sharp!

The world's thinnest ultra-portable packs a pop-up keyboard

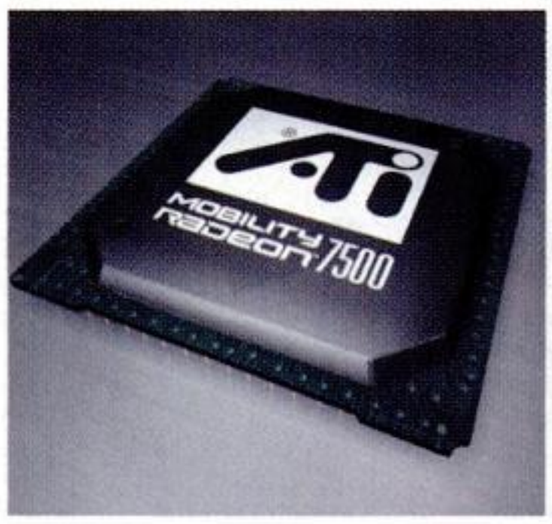
What do Amazon.com's profit margin, Mariah Carey's grasp on reality, and Sharp's new PC-UM10 notebook have in common? Answer: They're all dangerously thin. In fact, Sharp claims that its PC-UM10 ultra-mobile notebook now stands as the thinnest notebook available today.

The unit is an incredible 0.77-inches thick at its thickest section. To put this number in perspective, consider that Apple's super-slim Titanium G4 is 1-inch thick. Sharp was able to shrink the PC-UM10 by integrating a keyboard that compresses when the notebook is closed, and pops back up when opened. The PC-UM10 features a 600MHz Pentium III, 128MB of RAM, Ethernet support, a modem, a 20GB hard drive, and a 12.1-inch XGA screen, and weighs less than three pounds. Projected battery life is about three hours and can be increased to nine hours with an extended battery. The PC-UM10 will cost $2,000 without an optical drive.



TECH PREVIEW

ATI Muscles Back into 3D Mobile Market



Just when you thought notebook graphics couldn't get any faster, ATI is reporting that its new notebook chipset will be almost twice as fast as the fastest mobile 3D chipset currently available. Perhaps even better, it will sip power like a dainty little hummingbird.

The upcoming chipset is called Mobility Radeon 7500 and is based on a new 0.15-micron process. The 7500's 270MHz core clock speed bests the original Mobility Radeon's 166MHz core clock, while memory speed has been increased from 166MHz to 200MHz double data rate, for an effective speed of 400MHz.

Whereas the original Mobility Radeon had only one 3D pipeline and no transform-and-lighting features coded into hardware, the 7500 will have two 3D pipelines as well as hardware T&L present and accounted for. The new mobile chip will also feature a 128-bit memory interface and up to 64MB of DDR memory.

When a 7500-equipped notebook is running on battery power, the 3D chipset can crank down core and memory speeds to 66MHz, reduce the power-consumption of the notebook's LCD panel, and lower voltage accordingly. The fastest mobile 3D chipset currently shipping—nVidia's GeForce2 Go—has no such features. ATI says the fastest 7500 configuration will be twice as fast as a GeForce2 Go, yet consume between one-third and one-half as much power. Expect notebooks with the Radeon 7500 by the end of this year. ■

GAME THEORY

BY THOMAS L. McDONALD

Online Games Scream in Pain

■ I've spent a lot of time recently with *World War II Online* and *Anarchy Online*, followed by several hours of running around screaming in pain, clawing at my eyes, and shouting, "Make the bad man stop, mommy!" It wasn't that they were buggy, laggy, unstable, and slow... Well, actually, it was all that. Add in *WW2's* interface and communication elements that seemed deliberately designed to inflict pain ("Feel the rage and boredom of real war, thanks to our patented *Impenetrable Interface-o-Matic* and *60-Minute Transit Times*!") and *Anarchy's* installation errors that required an entire day to fix, and you have the Brave New World of next-generation massively-multiplayer gaming. I actually like a lot about *Anarchy Online*, but horrible stack-overflow errors and memory leaks (bush-league errors no professional programmer should make) continue to make the overall experience akin to bowling with ben-wa balls.

■ Casual observers can be forgiven for seeing the past few months as The Summer that Ate PC Gaming. The number of new releases reached its lowest level in years, and sales stagnated. Three of the 10 best-selling games had Sims in the title and one was the three-year-old *Rollercoaster Tycoon*. High-profile meltdowns claimed three high-flying companies. Fans greeted the death throes of Ion Storm, GOD Games, and Dynamix with (respectively) gleeful derision, relative indifference, and wistful sadness. Each closure came a few days after completion of a major, ultimately successful project: *Anachronox* (Ion Storm), *Max Payne* (GOD), and the *Tribes 2* final patch (Dynamix). "Gee, thanks for all the hard work and late hours getting this product shipped. Now get lost."

■ A weird phenomena related to cross-platform conversions is about to smack Ubi Soft right in the kisser. Ubi's *Grandia II* is one of the best RPGs for Dreamcast. I played it, and I enjoyed it a lot. Unfortunately, the current profit from Dreamcast sales lingers somewhere around the per-share value of Snowball.com's stock, so Ubi is bringing *Grandia II* to the PC (possibly since porting it to PS2 might actually generate revenue?). This is a bad move. A very bad move. Console RPGs are creeping death on the PC. Computer role-playing gamers are used to a specific kind of deep RPG (think *Baldur's Gate* and *Might & Magic*), and the anime-flavored, kiddie-oriented style of a Japanese console RPG (think *Pokémon*) is anathema. I liked the game and *still* wouldn't play it on a PC, because that's not what I want from a PC RPG. I can't explain this phenomena. Like gravity and teen pop stars, you just have to kind of accept it.

Tom McDonald has been covering games for countless magazines and newspapers for 11 years. He lives in the New Jersey Pine Barrens.

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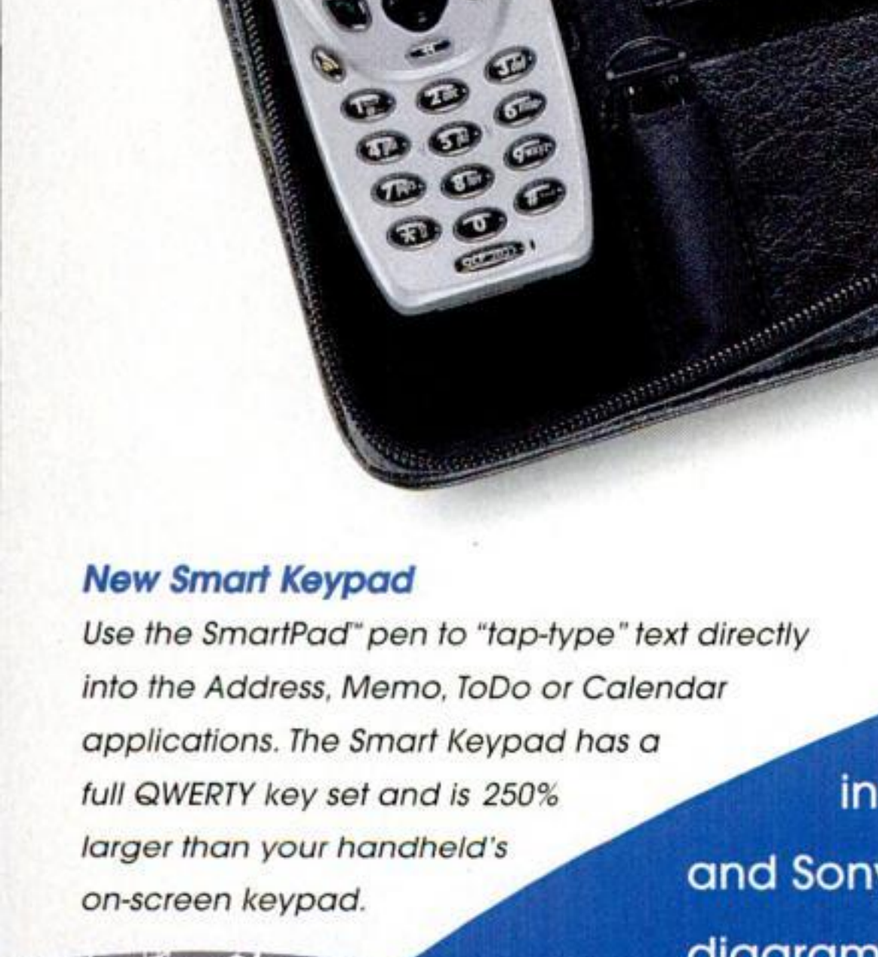

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Head2Head

A showdown among natural PC competitors

THIS MONTH: DV Cameras

Besides offering ease-of-use and increased quality over its analog video cousins (such as the VHS tape you pop into your VCR and the Hi-8 tape used in low-end consumer cameras), DV tape doesn't degrade over time. It can be played back millions of times without losing its luster.

Just like digital still cameras, DV cameras use CCDs (charge-coupled devices), which sense the color properties of incoming light and convert the light into bit-map images. This digital data is then written onto MiniDV tape, which boasts a color bandwidth three times broader than that of analog video. That makes for cleaner, sharper video. For this showdown, we look at two prosumer-level DV cameras, both capable of high-quality images created by three CCDs.

—EDWARD CHAMPION

CANON XL1

Portability: While the Canon does come with a shoulder mount to prevent bruises, it just can't compete with the Sony's light payload. The XL1's bulky magnesium-alloy body makes for shaky shooting, and this isn't mitigated by image-stabilizing features. **Winner:** Sony VX2000

Viewfinder: The Canon XL1 doesn't boast an LCD monitor, but it does feature a 180,000-pixel color LCD electronic viewfinder (EVF). Like many EVFs, the Canon's is sensitive to sunlight and can suffer burn-in in extreme bright-light situations. The EVF is equipped with a protective rubber gasket to address the problem, but we're still concerned by the gasket's flimsiness. The EVF can be mounted for either your left or right eye, but nothing beats the Sony's onboard LCD for monitoring tricky shots. **Winner:** Sony VX2000

Audio control: With an onboard gain that boosts signal strength by 6dB, the XL1's audio is considerably more flexible in manual mode than the VX2000's is. In 12-bit stereo mode, the XL1 is capable of recording four audio tracks simultaneously. An audio LCD monitor on the camera's back panel makes it possible for your sound engineer to monitor levels, and an easily detachable mounting arm allows professional-minded videographers to mount a Sennheiser MKH condenser mike with ease. **Winner:** Canon XL1

Lens: The XL1 offers an interchangeable lens system that provides considerable flexibility. Documentarians setting focus on the fly will also appreciate the XL1's quick zoom action time (nearly half a second faster than the VX2000) and broad focal range across a 16x optical zoom. **Winner:** Canon XL1

Stills: The XL1 can shoot still photos, but unlike the VX2000, you'll have to capture individual frames on tape and transfer them through a FireWire port. We found this method to be decidedly inconvenient. **Winner:** Sony VX2000

Controls: After suffering the VX2000's irrational button placement, we were delighted with the XL1's intuitive layout. We particularly liked the record button and zoom control, which are positioned at the top of the camera and come in handy when negotiating low angles. With buttons that actually take into account the anatomy of the human hand, the XL1's controls blew away the VX2000's. **Winner:** Canon XL1

Video quality: While lacking the super-vibrant blues and greens of the VX2000, the XL1 does offer softer image quality, which is great for capturing intimate human moments. Reds, browns, and flesh tones came out particularly nice, but the XL1 is noticeably grainier in low-light situations. **Winner:** Tie

MAXIMUMPC VERDICT

XL1
CANON

WHAT WE LIKE

Flexible controls, mountable lenses, and excellent audio control make this a prosumer camera that even a professional videographer might find satisfying.

WHAT WE HATE

After a long day of shooting, the XL1's bulky body becomes a back-breaker. And why didn't Canon throw in an LCD?

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SONY VX2000

Lens: The VX2000's 48x digital zoom (12x optical) bests the XL1's 32x digital zoom, but don't let the numbers fool you. Unless you have a lighting rig that rivals the sun in sheer luminosity, anything past 32x will come out with profound artifacting. The VX2000 has a narrower focal range (6mm-72mm) than the XL1 (4.4mm-88mm) and slower zoom action. Finally, you're out of luck if you don't like the lens shipped with the VX2000—it's not swappable with aftermarket lenses.
Winner: Canon XL1

Audio control: The VX2000 has a manual gain control, but no amount of tweaking provided the precise audio levels we desired—moving the control in either direction resulted in hiss. If you want sufficient audio control while shooting in unaccommodating locations, you'll find the VX2000 frustrating.
Winner: Canon XL1

Portability: Let's face it. If you're on an 18-hour shoot and you've got a choice between a light camera and a heavy one, you'd do well to pick the lightweight. Don't want to pull a neck muscle holding your camera? Then opt for the Sony (and like the XL1, it comes with image-stabilizing features).
Winner: Sony VX2000

Stills: Unlike the XL1, the VX2000 has a special mode for taking still photography. Unfortunately, the removable media format for still shots is Sony Memory Stick flash memory, which is useful only if you've got a closet full of Sony products (the format is exclusive to Sony). **Winner:** Sony VX2000

Controls: Like many Sony products, the VX2000 is ideal for anyone born with 15 tiny fingers. If you aim your thumb for the top-mounted record button, you'll likely find yourself poking the lens. Several of the digital effects buttons have been placed on the inside part of the flip-out LCD. Most egregiously, the shutter speed and white balance controls are on the back of the camera, making image adjustment an ordeal.
Winner: Canon XL1

Video quality: The VX2000 reproduced blues and greens extremely well and recorded surprisingly crisp footage with nary an artifact in low-light conditions. However, the VX2000 produced noticeably harsh earth tones and lacked the XL1's subtle richness overall. Nonetheless, both contenders' CCDs produce great-looking video, so choosing a video-quality winner really comes down to aesthetic preferences.
Winner: Tie

Viewfinder/LCD: In addition to a viewfinder equipped with a diometer (which adjusts the viewfinder to your own vision), the VX2000 comes with a color LCD for monitoring exactly what's being recorded. While the LCD was useless in harsh sunlight, and its brightness buttons didn't remedy this problem, the LCD's 180-degree rotation was helpful when we were leaning off the rooftop of a San Francisco skyscraper to get a shot of the city below. If you're interested in monitoring an elaborate shot setup without having to perform cranial gymnastics, the VX2000 is your boy. **Winner:** Sony VX2000

MAXIMUMPC VERDICT

VX2000
SONY

+ WHAT WE LIKE

The VX2000's vibrant colors, handy LCD, still-shot mode, and pure portability make for a compelling argument.

– WHAT WE HATE

For three Gs, we expect a much more accommodating control interface. What's more, the camera's lens situation isn't quite top of the line.

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THE UPSHOT

The XL1 may have made our shoulders ache, but its superlative audio and flexible lens system made up for the its shortcomings. Sony has a fine camera, but until it upgrades the VX2000's awkward control setup, we'll make due with the XL1's weaknesses when shooting our own *Seventh Seal*.

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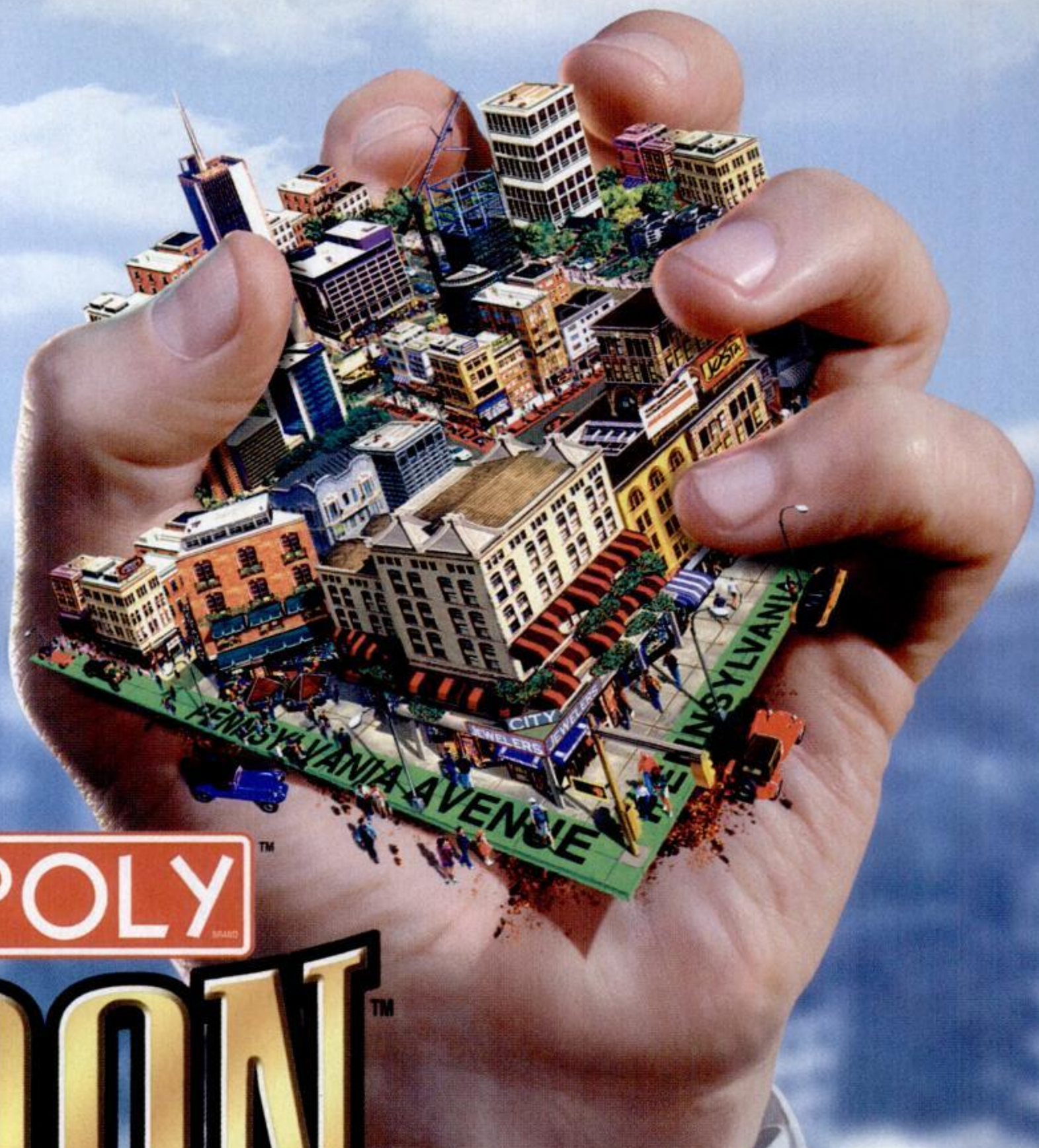

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WatchDog

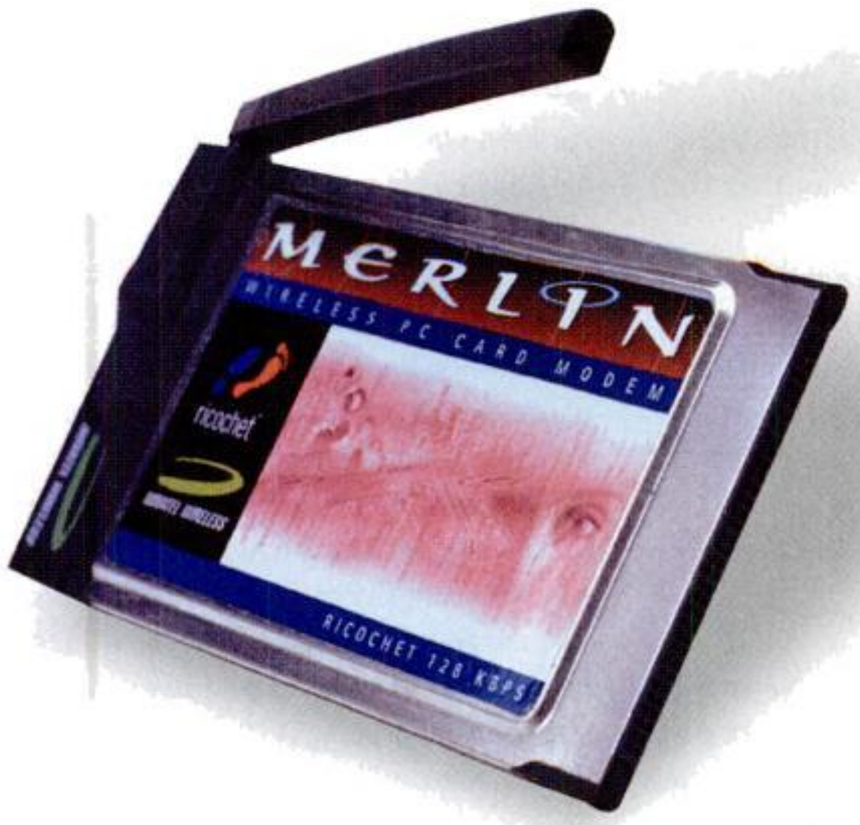
Maximum PC takes a bite out of bad gear

Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic The Dog on them by writing **watchdog@maximumpc.com**. The Dog promises to get to as many letters as possible, but only has four paws to work with.

This and That

The situation with Razer Boomslang mice continues to worsen. The Dog first touched on the gaming-mouse company's financial problems in the June 2001 issue of *Maximum PC*. Since then, the company has said it "exhausted all cash resources" and will discontinue providing customer, technical, and warranty support. The company apologized for the problems and promised to have updates on its web site. Razer states: "We sincerely hope to have the opportunity to re-earn your support in the future." At press time, however, www.razerzone.com was offline. The Dog warns that buying a Razer Boomslang mouse now for any more than fire-sale prices is a risky move.

In other news, Netpliance, manufacturer of the now-defunct i-opener internet appliance, has settled a suit brought against it by the Federal Trade Commission for allegedly using deceptive advertising, practicing unfair billing, misrepresenting federal laws, and violating the Mail or Telephone Order Merchandise Rule and the Truth in Lending Act. The short story is that Netpliance's i-opener couldn't live up to the advertised promise of providing access to the entire web. Netpliance also failed to disclose ISP service charges and charged consumers' credit cards without their consent, the suit alleged. As part of the settlement, Netpliance will refund consumers who were illegally charged, pay a $100,000 fine, and agree to refrain from similar methods of commerce in the future. Woof.



Metricom closes doors and unplugs wireless Ricochet network.

Ricochet's Last Bounce

Offering more proof that cool technology isn't a guarantee of success, cash-strapped Metricom shut down its Ricochet wireless network after the company was unable to find a buyer for the technology. The company had filed for Chapter 11 bankruptcy protection shortly before going under.

Metricom owned and operated a wireless network that offered consumers Internet connectivity at speeds up to 128Kbps through service providers such as GoAmerica, Wireless WebConnect!, Compaq, and EarthLink. With the death of Metricom, roughly 51,200 subscribers to the service are left holding the bag. Several ISPs The Dog contacted say they plan to offer Ricochet customers access to alternative wireless networks. Go America, which offered long-term contracts, says it expects to refund Ricochet customers who don't move to alternative wireless networks. Other ISPs, such as Wireless WebConnect!, have expressed interest in reviving Ricochet but haven't elaborated on how this could happen.

The High-Speed Rip Tax

In response to complaints by readers, The Dog has turned to The Doctor to investigate problems with audio ripping on high-speed CD-RW drives.

Having problems ripping the last couple of tracks on your audio CDs? You're not alone. We've seen an alarming increase in digital audio extraction (DAE) failures when ripping from commercial audio CDs that exceed 70 minutes in length. It started off as the occasional hiccup on 12x drives. As ripping speeds have increased on faster drives, the problem has surfaced to varying degrees on virtually every optical drive we've tested, even our beloved Plextors. Because we've seen the problem affect so many drives from different manufacturers, we've been hesitant to ding them for the flaw until we were sure the drives were to blame and not the discs.

High-speed CD-RW drives may experience problems ripping audio at the outer edges of discs.

"A good drive ought to be able to throttle down the speed if it gets a serious case of the shakes, or restart the process at least once in the event of a failure."

We're only talking about the last two or three minutes on a packed CD, so the problem is somewhat negligible, but it's also the kind of thing that could drive you crazy if you don't know why it's happening. We're now confident enough to say that it's likely a result of irregularities in commercially stamped CDs. These discs are pressed from nickel-plated masters that are good for up to around 150,000 pressings, after which they're pretty much ground into hamburger. Cheapskates, however, will push the stampers beyond their limits. Compounding the problem are slightly-offset hole-punches in the center of the discs, sloppy application of labels, and uneven distribution of ink on the surface of silkscreened CDs. Your boom box only plays at 1x, so these irregularities rarely affect playback. But high-speed extraction exaggerates the effects of these flaws,

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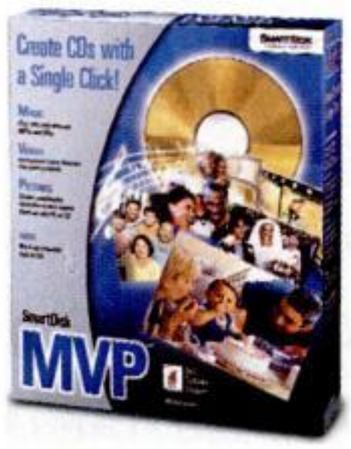

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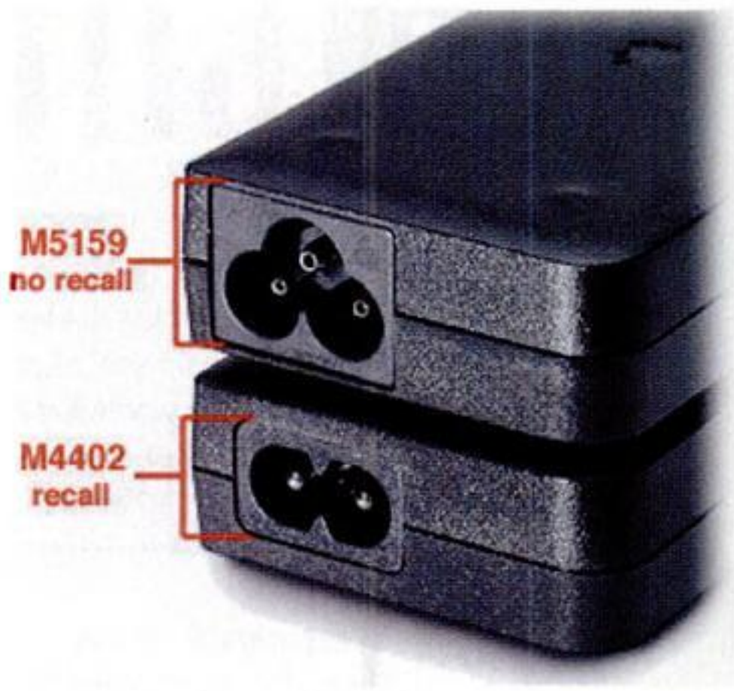
because the CPUs are "meticulously and thoroughly tested for each individual customer." Having ordered from STEP twice before, I expected this. But after three weeks, I began to wonder, so I sent an e-mail. I got an auto-respond message saying that they were trying to get to everyone, but very busy, etc. So I waited. And waited. And then I sent another e-mail. And another. Same thing. I tried calling and got a pre-recorded answer saying they were busy, please visit the site, try the special e-mail address, etc. Still nothing. Seven weeks later my credit card has been charged and the order is nowhere in sight.

The STEP site did eventually say that the company would stop selling CPUs and mobos because of end-user problems, but that was posted nearly a month after I ordered. And still I cannot get any direct response from the company. So, I guess I've been ripped off, but I hope you can put out the word to warn others.

—JACK FOSTER

"Seven weeks later my credit card has been charged and the order is nowhere in sight."

Jack isn't the only *Maximum PC* reader whom STEP ThermoDynamics seems to be ignoring these days. Despite a past record of pleasing its customers, several readers have complained about STEP's inability to offer satisfactory service. Reader Stephen Wagner said he returned a CPU for service under STEP's life-time warranty plan; months later, he still hasn't received a replacement part or been sent a status report from STEP. An official for the company did post a long message explaining the company's problems, followed by a terse message stating that the company had terminated "end-user sales." And true to the experience of readers, company officials have failed to respond to e-mails from The Dog. Even worse, at press time the company's main phone number had been disconnected "temporarily." Given the company's recent poor service and unresponsiveness, consumers, resellers, and dealers should consider STEP in the Dog House, and purchases—if the company still exists—off limits for now. Those who are unable to contact STEP directly should, of course, contact their credit card company about reversing charges on products that were not shipped. Consumers should also explore whether products they purchased from STEP are covered under the extended protection plans of their credit cards.



Power supplies sold with older G3 PowerBooks may catch fire.

Out of STEP ThermoDynamics

DEAR DOG: I think STEP ThermoDynamics has flown the coop on its customers—at least this customer, anyway. I ordered a 750MHz Pentium III and heatsink from STEP at the end of May. The company says it can take a week or two to ship the order

Recall Alert: Hot Apple Pies

Apple has voluntarily recalled more than half a million G3 PowerBook AC power adapters that may overheat and spark fires. The power adapters were made between May 1998 and March 2000. (The recall does not affect Titanium PowerBooks or iBook notebook computers.) Apple says the recall pertains to M4402 power supplies that use two-prong AC cords, not three-prong M5159 power supplies sold in Europe, the Middle East, and Africa. The affected power supplies were sold in North America, Japan, Latin America, and Asia Pacific regions and were bundled with the notebooks and sold separately. Apple urges consumers who have affected power supplies to stop using the adapter immediately. If you do use it, do not leave it unattended and check for signs of overheating. The power supplies are black and 4.75 inches long by 2 inches wide. A label on the side says "Macintosh PowerBook 45W AC Adapter" and "Model Number: M4402." Apple will replace the power supplies for free. Apple also recommends that you check two-prong AC adapters purchased from VST Technologies, which may be similarly affected. To check your power supply visit http://exchange.info.apple.com/exchange/ or call Apple at 866.277.2096. ■

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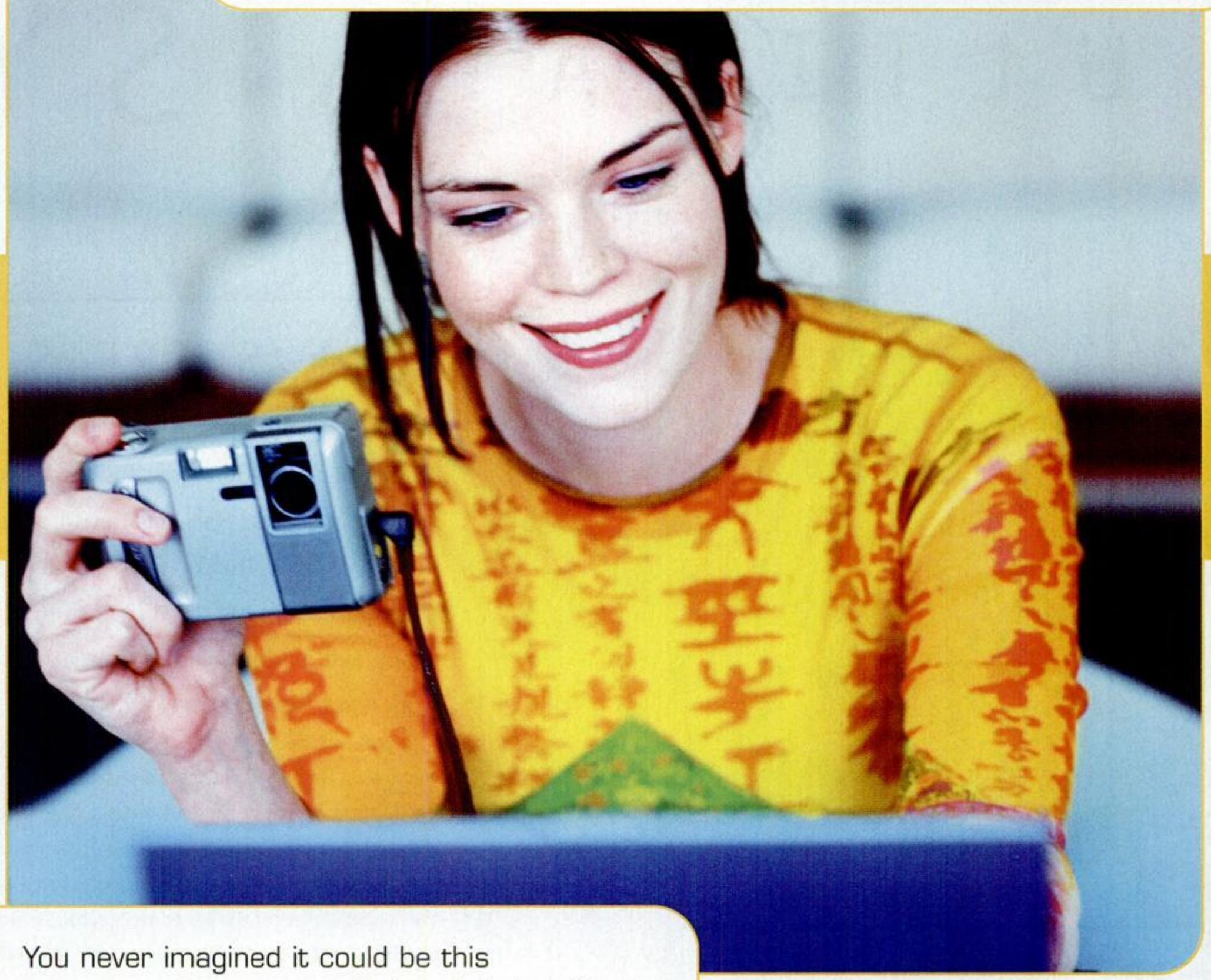

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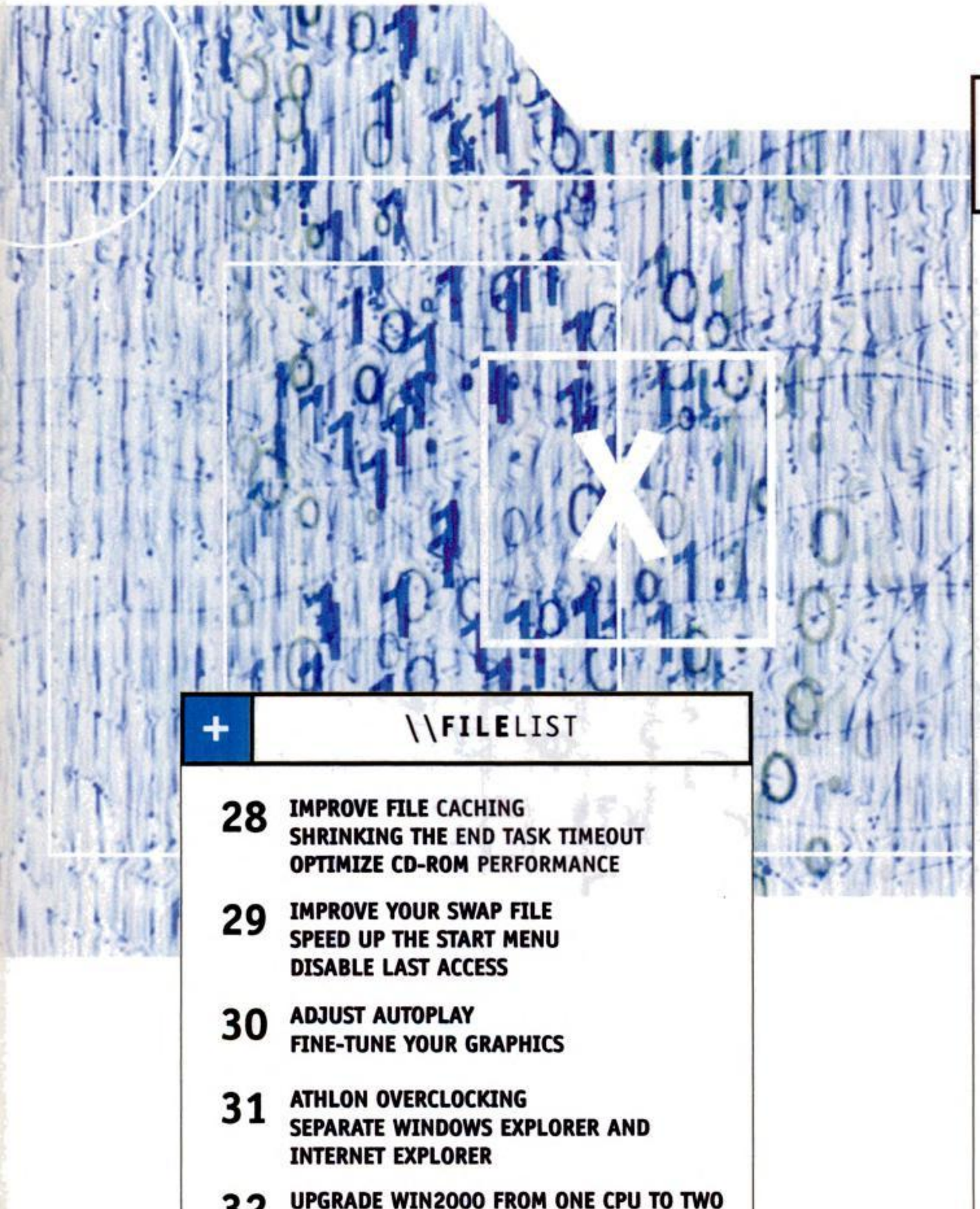
ULTIMATE SYS



SECRETS *of the*

True power users don't just add the latest hardware to their systems. They push every single component to its limit. They're not satisfied until each and every part sings and the OS has been whipped into shape and made to work the way *they* want it to work—not the other way around.

To this end, we combed the newsgroups. We eavesdropped on chat rooms. We tapped phones and peeked into briefcases, risking the ire of trigger-happy hardware hackers, all in order to bring you the secrets of the power users' dark craft. You won't find any of that "scan and defrag" crap in this article. These tweaks are from the darkest corners of the power user's cabal. In fact, some of the tweaks you'll find on the following pages are downright dangerous. We're bringing you the power—how you use it is your business.

What constitutes a tweak? A tweak is any alteration to hardware or software that's done to increase performance. This definition is fairly loose—after all, a tweak that doesn't necessarily add clock cycles to your CPU but does help you work faster and more intuitively can definitely increase performance. In our opinion, the following *don't* constitute tweaks: bug-fixes, cosmetic changes (which we place under the rubric of "customization"), and routine maintenance, such as flushing out your temp files and defragging.

It's difficult to provide quantifiable benchmarks for tweaks. If you want a huge performance increase, you might save yourself a lot of heartache by upgrading some of the weaker links of hardware in your system. But power users like getting under the hood, and they know that a half-second here and a couple of clock cycles there can add up to significant performance increases overall.

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REVEALING USELESS TWEAKS

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by LOGAN **DECKER**, WILL **SMITH**, *and* GORDON **MAH UNG**

TEM TWEAKS

POWER-USER ELITE

So why, you ask, don't hardware and software companies tweak their own products? Well, they do, in the form of upgrades and firmware updates, and you'd do well to keep up with these improvements. But most products are developed for the mass market, not for hot-rodders like yourself. A tweak that shrinks the swap file is great for folks with lots of RAM, but the same tweak applied to not-so-well-endowed systems could strangle performance.

It's impossible to guarantee that all the tweaks in this article will work on all systems. Some PCs, such as those from Falcon Northwest, come pre-tweaked and might be best left alone. Other systems may have custom OS installations that don't take well to being messed with. The idea is to experiment and see which tweaks work best for the kind of work and play you do.

Be aware that many of these tweaks will require you to edit the Registry—the fragile heart of the Windows OS. In order to do this, you'll need the Registry Editor. You can launch it by going to Start>Run and typing **regedit.exe**. Windows 2000 users also have the option of using the more sophisticated regedt32.exe. Keep in mind that Registry edits are applied instantly, and there's no undo. For a great tutorial on using both regedit.exe and **regedt32.exe**, go to **www.microsoft.com/WINDOWS2000/en/server/help/sag_ntregconcepts_kvzt.htm**. Once you've got the hang of it, you're ready to go.

So back up your system, pop open the hood, and let's get cracking.

X BEFORE YOU START

Tweaking can be toxic. A single error can cripple your system or even render it DOA. Overclocking, whether by manipulating your hardware directly or through software, will void your warranty. So heed this caution: If something goes awry, we won't be there to nurse your PC back to health. That stated, we believe even newbies can perform most of the tweaks we've included, if some basic precautions are followed:

If you make any changes to your BIOS settings, write them down. Overconfidence in one's short-term memory can result in a PC that doesn't boot.

Do not—we repeat, do not—perform any of these tweaks unless you have backed up your system files (win.ini, system.ini, autoexec.bat, config.sys, and msdos.sys). Better yet, create an image of your drive using a utility such as *Drive Image Pro*. This is a simple procedure that takes only a few minutes and guarantees a fresh start after a boo-boo.

Keep one folder for your old exported Registry keys, in case you need to replace them later. You can do this with Regedit by selecting Registry > Export Registry File. Choose "Selected branch" under the Export Range, name your tweak, and select OK. Several astute readers have pointed out that it's possible to REM out Registry keys using semicolons, but we think this is a terrible idea. Trying to improve the performance of your Registry while littering it with null values is tantamount to leaving a sponge in the patient after surgery.

Extra-smart folks will take the additional step of exporting altered Registry keys, as well, in a different folder. This way, if you have to reinstall your OS at a later time, you've got a folder with all the changes you've made to your Registry.

Keep at least one backup copy of your entire Registry.

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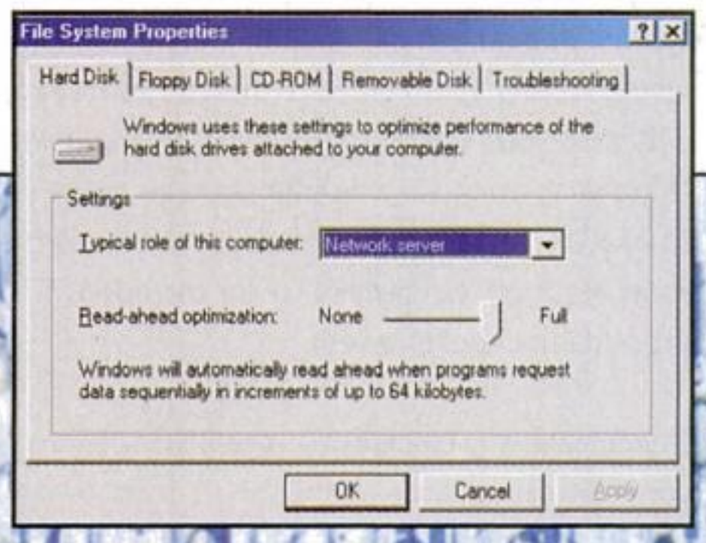
X IMPROVE **FILE CACHING**

This first tweak should help speed up drive performance when reading long files and streaming media. Right-mouse-click My Computer, click Properties, then go to the Performance tab. Click the button for File System. Under the Hard Disk tab, set the "typical role of this computer" to "Network server" instead of "Desktop computer." When set to Desktop, Windows 98/ME will allocate about 10KB of memory for storing the 32 most recently accessed folders and the 677 most recently accessed files. By setting it to Network, about 40KB is used to cache the 64 most recently accessed folders and the 2,729 most recently touched files. This tweak can reduce the amount of coasters burned with a CD-RW drive and should generally help with any kind of optical or magnetic disk access. This tweak works in Win98, WinME, and Win95 OSR 2.



X SHRINKING *the* **END TASK TIMEOUT**

When applications crash, the first line of defense is the classic three-finger salute: Ctrl-Alt-Delete. But adding insult to injury, Windows can take up to a minute before sprouting a dialog box that allows you the option to end the task. Now you can go in for the quick kill with this easy Registry tweak.

First you'll want to minimize the time it takes for the End Task dialog to appear. Open Regedit and go to **HKEY_CURRENT USER\Control Panel\Desktop**. Right-click the right-hand pane and create a new string value: **HungAppTimeout**. Double-click your HungAppTimeout and set the value to 3000 (three seconds).

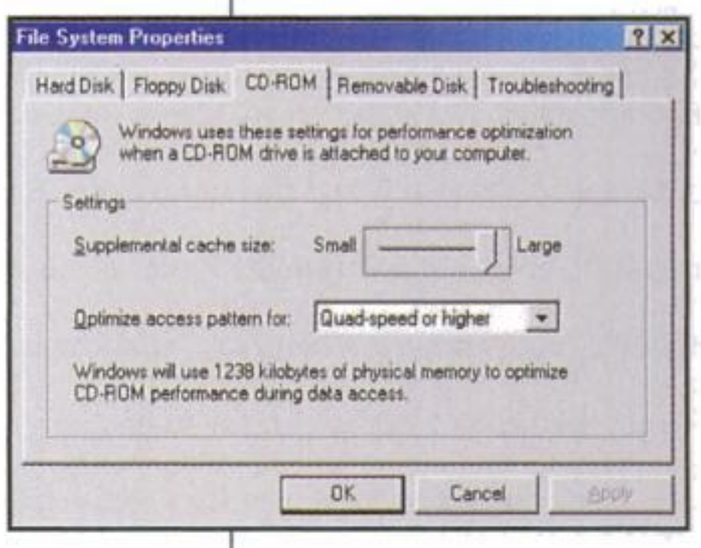
Next you'll want to shrink the time Windows spends waiting for responses from stubborn apps during shutdown. Right-click the right-hand pane again and create a new value called: **WaitToKillAppTimeout**. Double-click this value and give it a value of 5000 (five seconds).

It's possible to assign even lower values to these timeouts, but we don't recommend it, as you might end up killing all tasks by hanging Windows itself.

X OPTIMIZE **CD-ROM PERFORMANCE**

In the System Properties dialog box, select File System, and click the CD-ROM tab. Here, Windows will allow you to adjust the supplemental cache size and optimize the access pattern for CD-ROM drives up to "quad-speed or higher." The supplemental cache size should be set to "large," unless you never burn CDs and want to save a tiny bit of your RAM. However, because modern PCs have an optical drive that far out-performs a quad-speed dinosaur, you can optimize your access pattern for speeds in excess of quad-speed through this Registry tweak. (This tweak doesn't affect DVD-ROMs, but will assist CD-ROMs read in DVD-ROM drives.)

Open Regedit, and go to **HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\FileSystem\CDFS**. Depending on your version of Win95/98/ME, you'll have to edit in either decimal or hexadecimal. You can increase CacheSize from the default of decimal 619 (hex 26B) to 2476 (9AC). To increase the buffer size from the default quad-speed support, change the Prefetch line from its default of 228 decimal (hex E4) to decimal 1792 (hex 700). That tells Windows to optimize for a 32x drive instead of a 4x CD-ROM.



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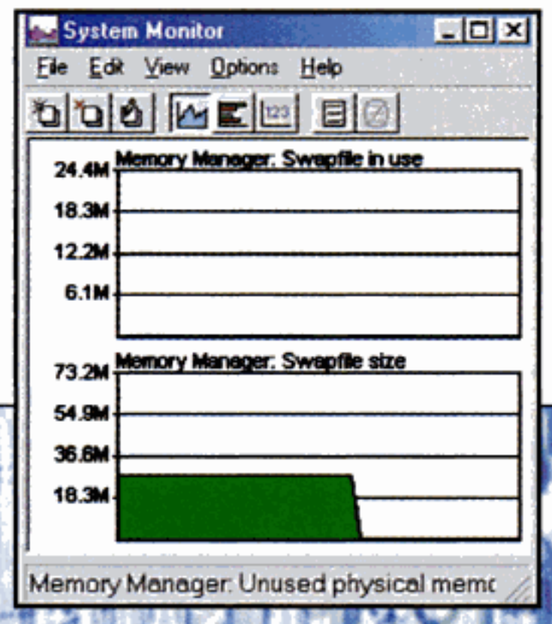
X IMPROVE YOUR **SWAP FILE**

To increase performance during swap file use, many power users lock the file to a fixed, contiguous portion of the hard drive. This prevents Windows from constantly resizing the swap file, which results in the file becoming heavily fragmented and sprayed over the expanse of your hard drive, which, in turn, slows access times.

The previous convention was to set the swap file to twice your amount of RAM. That's a good place to start, but everybody has different needs. To figure out how large your swap file needs to be, fire up System Monitor (Programs>Accessories>System Tools). If it wasn't selected when you installed Windows, go to Start>Settings>Control Panel>Add/Remove Programs>Windows Setup>System Tools and install it. Once you have a good idea of how large your swap file gets, click My Computer/Properties/Performance tab and then Virtual Memory. Disable virtual memory, then reboot your machine. You should be warned that in configurations with 64MB or less of RAM, this could stop Windows from booting. Once you've rebooted, defragment your hard drive. Once the defrag is complete, go back to Virtual Memory and click "Let me specify my own virtual memory settings."

If you have between 32MB and 128MB of memory, set your minimum swap file size to *twice* the amount you observed through the System Monitor. Leave the maximum setting alone.

If you have more than 128MB of memory, a swap file set to a minimum and maximum between 250MB and 300MB should be more than enough.



X SPEED UP *the* START MENU

For some inscrutable reason, Windows inserts a small delay before displaying the cascaded menus of the Start button. Maybe they thought that an OS that was too responsive might deliver an overwhelming shock to some users. Who knows. Here's a Registry tweak that will allow you to specify your own delay, or better yet, eliminate the delay altogether. Open Regedit, and go to: **HKEY_CURRENT USER\Control Panel\Desktop**. Create a new string called **MenuShowDelay**, or modify the existing one, if present, by right-clicking it and selecting Modify. Once your string has been created or prepared for modification, enter a value from 0 to 999 (milliseconds).

X DISABLE **LAST ACCESS**

If you're using Win2000 and the NTFS file system (you *are* using NTFS, right?), every time you go poking around in a directory, the OS updates the Last Accessed date/time stamp on the folder. While this is a boon to paranoiacs, the rest of us could probably find better uses for our CPU clock cycles. Use Regedit to put an end to this nonsense by going to **HKEY_LOCAL_MACHINES\System\CurrentControl Set\Control\FileSystem**. In the right-hand pane, look for **NtfsDisableLastAccessUpdate**. If you find it, change the decimal value to 1. If it's not there, create a new DWORD value by right-clicking the right-hand pane, selecting New > DWORD value, naming it **NtfsDisableLastAccessUpdate**, and giving it a decimal value of 1.

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X ADJUST **AUTOPLAY**

One of the first things we do with a new system is turn off what might be the most annoying Windows feature ever: Autoplay (which automatically launches all CDs as soon as they're inserted). An unfortunate side effect is that Windows no longer automatically updates My Computer with the label and contents of CDs you insert. We can fix that with a simple Registry tweak.

Fire up Regedit (or regedt32 if you're not a little girly man), and make your way to **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Cdrom**. Once there, you need only to change the **Autorun** key from 1 to 0. This keeps Windows from running the Autorun script on application CDs, but still lets Explorer know when a new disc is inserted.

X FINE-TUNE YOUR **GRAPHICS**

We know you've already turned down your color depth from 32-bit to 16-bit, but if you've ever wondered what some of the other mysterious settings in your videocard's control panel do, peep this. Because there are so many videocards on the market, we're keeping this as general as possible.

Antialiasing: Straight lines that improperly render as jagged lines have long been the bane of PC gaming—but now antialiasing can eliminate the dreaded "jaggies." This rendering technique eliminates jaggies by either sampling several, nearly identical images (called multisampling), or by rendering one high-resolution image and scaling it down to the display resolution (called supersampling). Either of these techniques effectively eliminates the stair-stepping effect. Unfortunately, antialiasing is a major resource hog and should be disabled for all but the newest graphics chips and fastest machines.

Mipmapping levels: Mipmapping speeds up the rendering of texture-mapped polygons. When you look at a 3D object, you're seeing a wireframe mesh model with a texture wrapped around it. An object that is further away from your viewpoint requires smaller, lower-resolution textures than an object that is nearer. Mipmapping is the process of resizing and filtering the large, high-resolution textures down to the lower-resolution sizes.

The bottom line is that the more mipmap levels you run, the more video memory you need. On cards with 8MB or less of memory, you can get a hefty performance boost by setting mipmapping to the lowest available setting.

Texture filtering: Because textures aren't necessarily the same exact size as the objects they're wrapped around, they sometimes need to be stretched. This stretching can create artifacts. To combat these artifacts, different texture filtering methods are used. These days most 3D accelerators support both bilinear and trilinear filtering in hardware. That means simply that there's no performance hit for enabling them. Trilinear filtering produces great image quality, but is only effective when a texture is viewed head-on.

Anisotropic filtering bypasses this limitation by sampling more pixels than bilinear or trilinear filtering. Unfortunately, all that extra work takes a toll on your 3D accelerator. So what do you tweak? Current state-of-the-art graphics cards such as nVidia's GeForce3 don't appear to suffer major performance hits even with anisotropic filtering enabled, but older-generation cards can suffer performance penalties from anisotropic or trilinear filtering, so setting your card to bilinear filtering could give you a few extra frames per second. Of course, in online games, the higher your frame rate, the longer you live, so even GeForce3 owners might want to switch to bilinear filtering.

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X ATHLON OVERCLOCKING

When manufacturers began "locking" their CPU multipliers to discourage easy overclocking, the world of hardware hacking grew a little more hostile. With multipliers locked down on the assembly line, increasing the system bus speed emerged as the only way to run a CPU beyond its rated speed. But this technique also stresses the videocard, memory, and PCI cards of such overclocked systems.

Enter AMD, God bless 'em. With the introduction of the Thunderbird Athlon and Duron, bypassing the multiplier lock required no more than a few minutes and a No. 2 pencil. This is the worst-kept secret among power users, and a good tweak that almost always guarantees a performance boost.

It's important to remember that while a CPU may be rated at, say, 1GHz, it might actually run comfortably at much faster speeds. This is most often the case for CPU families that are at the end of their life cycle. For example, when the Thunderbird Athlon family launched, 1GHz CPUs probably bore very little headroom to run faster. But as AMD improved its Thunderbird process technology and began spitting out CPUs with more frequency headroom, 1GHz CPUs sold during this period probably could have just as easily been sold as 1.2GHz CPUs—and *these* are the CPUs that are most friendly to overclocking.

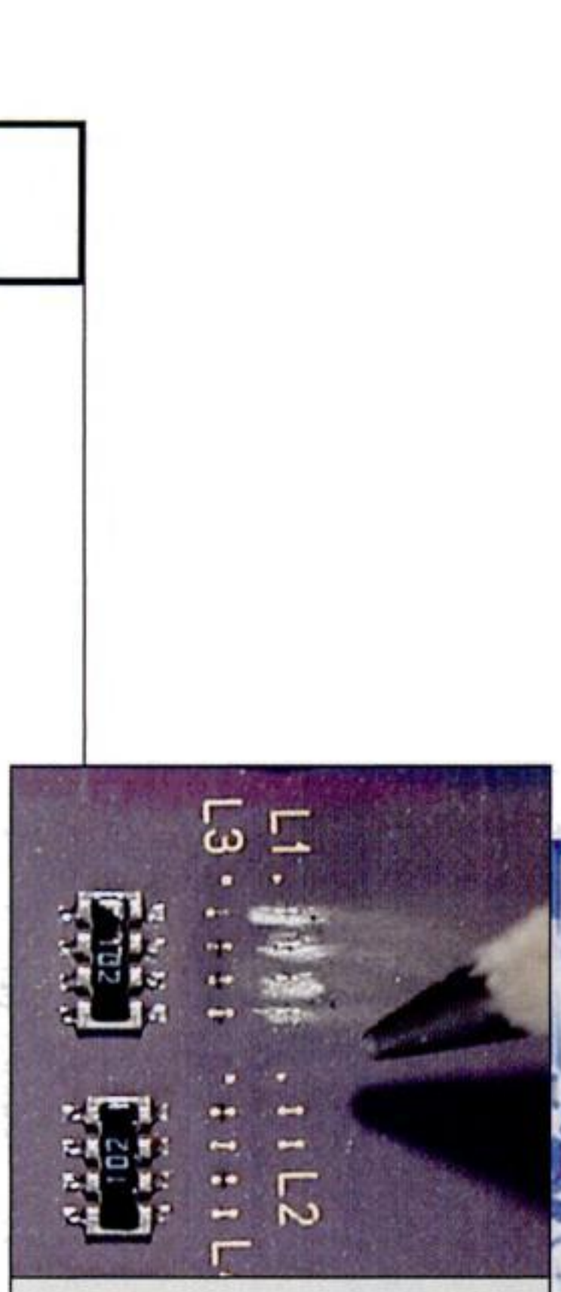
The caveat is that overclocking a CPU voids your warranty and can kill your processor or motherboard if things go south. Still interested? Fine, here's the best little tweak this side of Sunnyvale, California. It's applicable to all Thunderbird Athlons and Spitfire Durons (it may work with later AMD CPUs, but we haven't confirmed this).

First, observe all anti-static precautions. Next, remove your heatsink from the CPU and remove the CPU from its socket. Be careful with the pins, as bending or breaking one will ruin your day. While examining the CPU under a good light, you'll see a set of small gold contacts labeled L1 through L7 along the face of the CPU (you'll also see the AMD label and "Assembled in Malaysia"). Directly to the right of the label "L1," you should see a row of eight contacts that resemble dots. Get a sharp No. 2 pencil and carefully connect each pair of dots along the same axis as the L1. When you're done, you should have four pairs of connected dots (see photo).

Once you're done, put the CPU back in the motherboard, mount the heatsink, and fire up your PC. You should immediately be able to change your clock-speed multiplier in the BIOS or via jumpers on the motherboard. If the machine refuses to let you change the multiplier, you probably didn't connect the contacts correctly.

If this pencil trick sounds hokey, but you still want to access the clock multipliers, consider trace tape. Trace tape, available from **www.plycon.com**, is tiny tape with conductive strips on it; you can stick some on your CPU to connect the dots, so to speak. Trace tape also happens to last longer than pencil lead.

If you encounter instability after overclocking your CPU, you may try increasing the core voltage of your motherboard via the BIOS or by jumpers. This, again, may kill your processor. Also keep in mind that overclocking will require increased cooling. For more information go to **www.overclockers.com**.



By connecting the L1 dots on Thunderbird Athlons, you can easily overclock your processor. Just make sure when you join them, you don't smear lead from one pair of contacts to another.

X SEPARATE WINDOWS EXPLORER *and* INTERNET EXPLORER

Part of the magic of the browser integration built into Windows is that a badly coded web page can crash not only *Internet Explorer*, but Windows Explorer as well. That's because Windows runs both processes as a single thread. To put things back to the way nature intended them to be, open up your Control Panel and click on Folder Options. Go to the View tab, and make sure that "Launch folder windows in a separate process" is checked. While this tweak will eat a little more of your systems memory, the added stability it brings is well worth the sacrifice.

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X UPGRADE WIN2000 *from* ONE CPU *to* TWO

Dilemma: You finally shelled out the big bucks to get a second processor for your empty motherboard slot, but the version of Windows 2000 that you've got installed won't recognize your second CPU. Never fear, all you need to do is load up the trusty Device Manager, open the Computer section, and double-click the item that's in there. It should be called either Advanced Configuration and Power Interface (ACPI) PC or Standard PC. Now, go to the Properties menu, click the Driver tab, then click the Update Driver button. Select "Display a known list of drivers for this device" and press Next. Make sure to select "Show all hardware of this device class," then select the type of PC that applies to you. It should be "ACPI Multiprocessor PC" if your machine is ACPI-compliant, or "MPS Multiprocessor PC" if your machine doesn't support ACPI.

X BASIC BIOS TWEAKS

Your BIOS is home to your PC's most essential hardware settings, which can yield performance gains when properly tweaked. Not everyone's BIOS settings will be the same, but the tweaks you'll find here should apply to the majority of today's motherboards. The best thing about these tweaks is they're easy to perform and can be reversed should you experience problems.

In most cases, you can enter your BIOS screen by hitting Delete or F1 during bootup. To find the specific settings mentioned below, page through your BIOS menus until you land on what you're looking for. If your BIOS doesn't cooperate, consult your motherboard documentation. With that, let's get tweaking!

The Video BIOS Shadow setting is usually enabled by default. This copies your videocard's BIOS to RAM, and allows it to run faster when working in old DOS applications. Because Windows applications don't access the videocard's BIOS (they write directly to the videocard instead), enabling the shadow simply wastes memory. There's also a slight chance that your motherboard will only copy the first 32KB of the video BIOS, even if the BIOS is larger than 32KB. This can lead to general instability issues.

While you're in the BIOS, also set the System BIOS Cacheable, Video BIOS Cacheable, and Video RAM Cacheable settings to "Off". Windows won't use these functions after boot up, and enabling the features will eat up a portion of your precious L2 cache. If your CPU Level 1 Cache and CPU Level 2 Cache aren't enabled, they should be. Turning on both allows the L1 and L2 cache of your CPU to work properly. If you want to see how much slower your system is without cache, disable L1 or L2 and watch it crawl!

If you have the ability to enable the Delayed Transaction setting, do so. This will create a write buffer that will help speed up transactions during ISA and PCI accesses. The Passive Release setting should also be enabled. This will let the CPU read and write to the PCI bus while communicating through the ISA. Both settings, of course, depend on your motherboard's support for ISA.

Even boring old Intel motherboards let you to enable the CPU L2 Cache ECC Checking setting. ECC stands for error correction code, which lets your machine look for single and multi-bit errors in the L2 cache. Most power users are split on whether to enable or disable this feature. Some believe that enabling it is very important for overclocked systems, while others believe no errors will ever be discovered in such a small amount of cache. The tweak's actual performance benefits may be negligible, but enabling the setting is unlikely to generate any negative side affects.

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X SPEED UP YOUR VIDEOCARD

So you think *Maximum PC* would never publish anything that could wipe out your hardware? Think again. Overclocking—i.e., forcing an integrated circuit to run faster than the speed it's rated for—really *can* kill a component. But if you're willing to take a risk in return for a substantial speed bump, overclocking can often yield happy results. And overclocking a videocard is easier than most people think.

Download an evaluation copy of *Power Strip 3.0* from **www.entechtaiwan.com/ps.htm**. Install the application, click the icon in the system tray, and go to the Configure tab under Performance profiles. *Power Strip* will show you the current engine clock speed (i.e, core speed) and memory clock speed of your card. Now begin increasing your speed settings in small increments. Check for stability by playing a few of your favorite games for a few minutes. If you see visual defects such as snow or flecks, or if your machines crashes, it's time to back it down to a lower speed and/or add more active cooling to your video chipset. *Power Strip* works with most brands of videocards, but nVidia GeForce owners should download *GeForce Tweaker* from **www.Guru3D.com**. This application is optimized for the GeForce lineup and lets you toggle features specific to nVidia technology.

X WIN9x MEMORY MANAGEMENT

If you've ever noticed that your Windows 98 or Windows Millennium swap file seems to grow like the blob and consume your entire hard drive, here's a little tweak that'll send it packing. First open the **SYSTEM.INI** file that's located in your Windows subdirectory. Then, under the header named **[386Enh]**, add the line: **ConservativeSwapfileUsage=1**. This essentially disables the "advanced" memory management features of Win98 and Millennium and forces the OSes to function just like good-old Windows 95. Microsoft warns that this tweak will actually degrade system performance, but we found that our PCs experience less disk-thrashing with the tweak enabled.

0 TWEAKING UTILITIES

Too timid to do your own tweaking? Itching for more tweaks? No problem. Here's a quick 'n' dirty list of the best sites to troll for up-to-the-minute tweaks and freeware utilities that will do most of the dirty work for you.

■ Xteq's **X-Setup** (**www.xteq.com**) is the granddaddy of tweaking apps. Billed as the "black belt" of system tuning tools, X-Setup gives you control of more than 750 system settings across every version of Windows, including Windows XP. You can tweak your interface, performance settings, preferences—just about anything you can think of. Even better, it's free for personal use. A must-have.

■ Developed by the homeys at Microsoft, **TweakUI** has been a mainstay of tweakers since its hush-hush appearance on the Windows 95 CD. Note that these tools, which provide a GUI interface for tweaking system settings, system file and folder locations, and more, are not supported by Microsoft. You can grab the latest version at **www.microsoft.com/ntworkstation/downloads/powertoys/networking/nttweakui.asp**.

■ **Tweakfiles** (**www.tweakfiles.com**) is *the* place to go for tweak utilities, offering all-you-can-eat links to hundreds of utilities, Registry files, and benchmarking apps. You'll also find some great forums at this site, where you can pick up pointers on tweaking the latest hardware.

■ A site dedicated to the cult of the tweaker, **Tweak3D** (**www.tweak3d.net**) offers news, reviews, and how-to guides for tuning up your PC. But it's also an extensive resource for hardware-specific tweak guides. This is the best place to start for a primer on tweaking your BIOS settings or figuring out how to squeeze a few more FPS out of that TNT2 Ultra.

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X VCACHE OPTIMIZATION

While you're in the **SYSTEM.INI**, consider adding the famous (or sometimes infamous) Vcache tweak. Under the header named **[vcache]**, add the lines **MaxFileCache=8192** and **MinFileCache=8192**. This directs Win95/98/ME to use only 8MB to cache the hard drive. Conventional wisdom dictates that you should set aside about one-third of your overall memory for the cache. But we've successfully set the cache as low as 4MB to boost overall memory space. Left to its own devices, on a machine with only 192MB of RAM, Windows will balloon the cache to 64MB. It must be noted that Microsoft advises to leave these cache settings alone, and we have experienced odd problems in gaming after setting the Vcache manually. In *Half-Life*, for example, the game would crash back to the desktop. Fortunately, these Vcache tweaks are easy to reverse.

X BRAND-NEW CHIPSET DRIVERS

New motherboard chipsets—such as VIA's KT133A, ALi's MAGiK 1, AMD's 760, and Intel's 815EP and 850—aren't natively supported by Windows 98 Second Edition, Millennium, or Windows 2000. However, because the latest Microsoft operating systems offer basic functionality with unsupported chipsets, many newbies simply install the OSes and are none the wiser. And then performance problems occur, followed by general instability—all because the OS is fighting with outdated chipset drivers. Sadly, after years of using OSes with native support for Intel's 440BX chipset, even experienced system builders fall into this trap.

Moral of the story: If you've just installed a new OS, and you're running a later-model board, you should get the latest chipset drivers for your motherboard. Install these drivers first, then reinstall your other drivers. Even if you *did* load the motherboard chipset drivers that came with the board, you should get updated drivers from the web site of the motherboard or chipset vendor. Such revisions can add performance and stability, particularly in gaming.

X REVEALING USELESS TWEAKS

Just as there have always been charlatans traveling from town to town selling revitalizing tonics, there have always been mysterious hacks floating around the net, offering faster performance in exchange for the three minutes it takes to, say, add a mysterious "GoFast" DWORD Value into the Registry.

Here are three typical losers that promise performance and efficiency, but deliver only a sharp pain in the ass.

Upgrade the CPU Priority for Foreground Apps

When we first read about this relatively simple tweak, we were flabbergasted. By adding a few keys to the Registry, we were promised a hefty performance boost for foreground apps. Why would this work? In Windows 9x, unlike Win2000, the amount of CPU time each application gets is automatically assigned by the OS. Unfortunately, when we tried the tweak there wasn't a benchmark increase, and some benchmarks actually ran slower.

What's the moral of this story? We've found that most of the time, Windows knows what it's doing when it comes to assigning CPU priority to apps.

Share One Swap File with Two OSes

If you multi-boot two different Windows OSes, you should know that they both create swap files, each of which can take up hundreds of megabytes of disk space. It didn't take a genius to figure out that you could use the same swap file with two different OSes. Of course that doesn't mean you *should*.

Although both Windows 2000 and Windows 9x share the same names and basic structure for the swap file, if you want to boot both OSes, you should use two different swap files. Why? Because minor errors can be introduced into the swap file by sharing, and if it becomes corrupted as a result, the entire swap file will be recreated every time you reboot. At worst, shared swap files can cause the system to crash.

If you want to boot two OSes, suck it up and have two swap files. The only thing that could be worse than this is sharing the hibernat.sys with Windows 2000 and Windows ME.

Registry Hack to Reduce System Restore Disk Space

Sometimes people get a little stupid when they start digging around in the Registry. Lately, we've seen a hack that lets you change the amount of disk space that Windows ME's System Restore eats up. That's great, right? Wrong! Why bother with the Registry when it's much safer and easier to use the interface that Microsoft cleverly provided for you. All you need to do is right-click My Computer, select Properties, click the Performance tab, select File System, and drag the System Restore disk space use slider to the desired amount. *Duh.* ■

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The Voodoo assembly triad: (left to right) Crystal Lapaire, Jiazeng Shi, and Karlo Keet.

BY LOGAN DECKER AND KRISTEN SALVATORE

A high-end custom PC vendor conjures up machines that are works of industrial art. Witness the method to their interior design magic.

how they do that VOODOO that they do

Open a typical PC case and you'll be greeted by the grisly sight of electronic viscera—cables smothering your motherboard, and LED wires gar-roting helpless SIMMs. But you'll find no such horrors inside a Voodoo machine. Custom PC manufacturer Voodoo (**http://voodoopc.com**) specializes in constructing smoking-fast gaming machines with the cleanest, most elaborately detailed case interiors known to PC-kind. Founder and President Rahul Sood recalls an early strategy meeting that was the genesis of Voodoo's design aesthetic:

"We were eating sushi at a popular Japanese restaurant, and we started talking about how Japanese food is more than just something you chew and swallow—it's a work of art all the way down the line. Packaging and presentation are just as important as the taste. In fact, it almost seemed like the better-looking sushi actually tasted better. We discussed ways that this concept could be aligned with our own visions of Voodoo's future, and the rest, as they say, is history."

From brilliant interior paint jobs to wiring that must be seen to be believed, the sheer craftsmanship of Voodoo systems is unlike anything we've ever witnessed in even home-built rigs. We spoke with Sood about his company's enchanting artistic bent and grabbed some pics of Voodoo's most amazing creations. We also chatted up Jiazeng Shi, the origami master recruited by Voodoo to craft its astounding wiring jobs. The images on the following pages speak for themselves.

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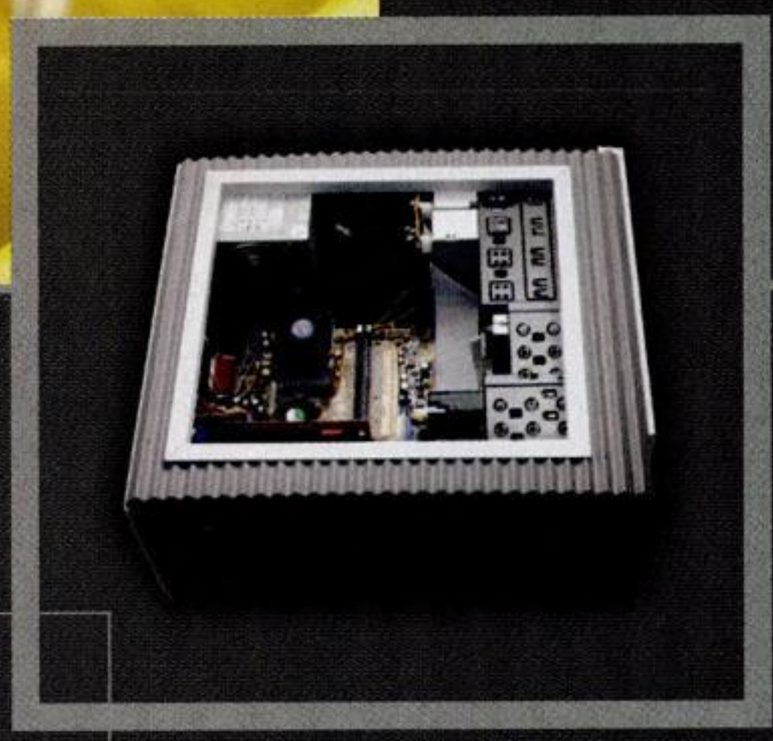
CABLE CHARMERS

Excess IDE cabling is neatly doubled over on itself and secured with zip ties. Most of Voodoo's cables and wires are designed to stay in place with a minimum of fixtures—a nod to traditional origami, which emphasizes folds that retain their shape without the use of scissors or glue. In certain areas where cables are likely to be jostled or moved frequently (such as near these hard drives) they're also affixed to the case with a bit of double-sided tape.



The "Eye of the Storm" window pictured to the right was originally designed to show off the PC's interior, but also happened to slightly lower system temperatures, a serendipitous by-product of fancy design.

INTERIORS | THE VOODOO WAY

Voodoo's president says: "A component like the neon light is purely aesthetic, whereas the [specially folded] cabling grew out of a need for greater airflow and ended up being aesthetically pleasing as well."

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WIRES WITH A TWIST

In this shot, the motherboard connectors are pulled together and wound into a coil. We can posit many arguments for neatly bundling these connectors: They're less likely to be inadvertently yanked out by klutzes, it's easier to see the connector labels, and it makes good sense to logically group related wires. But the bottom line is *coiled wiring looks incredibly cool.*

CROUCHING WIRES, HIDDEN CABLE

Jiazeng Shi's team is undaunted by a surprise attack mounted by an IDE RAID controller card. With crisp, triangular folds, both cables are run along the floor of the case, keeping them out of the way of other components and increasing airflow within the PC. Note the sly USB header cable running along the bottom of the motherboard, taking a sharp right, and crawling beneath the PCI cards.

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19. EEPROM on certain modules
20. Delays memory for one clock cycle
21. Operates at 133MHz
22. Detects and corrects errors
23. A speed of DDR
Down
1. Detec
2. Module
3. Number of ed
4. Module with 168 pi
5. No error-checking capab
7. Typically used in laptops
8. Delivers synchronous bursts of da
10. Asynchronous DRAM, faster than FP
11. Chip set deals directly with memory
12. The "D" in DRAM
14. Abbreviated Mb
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A-5 March 15, 2001
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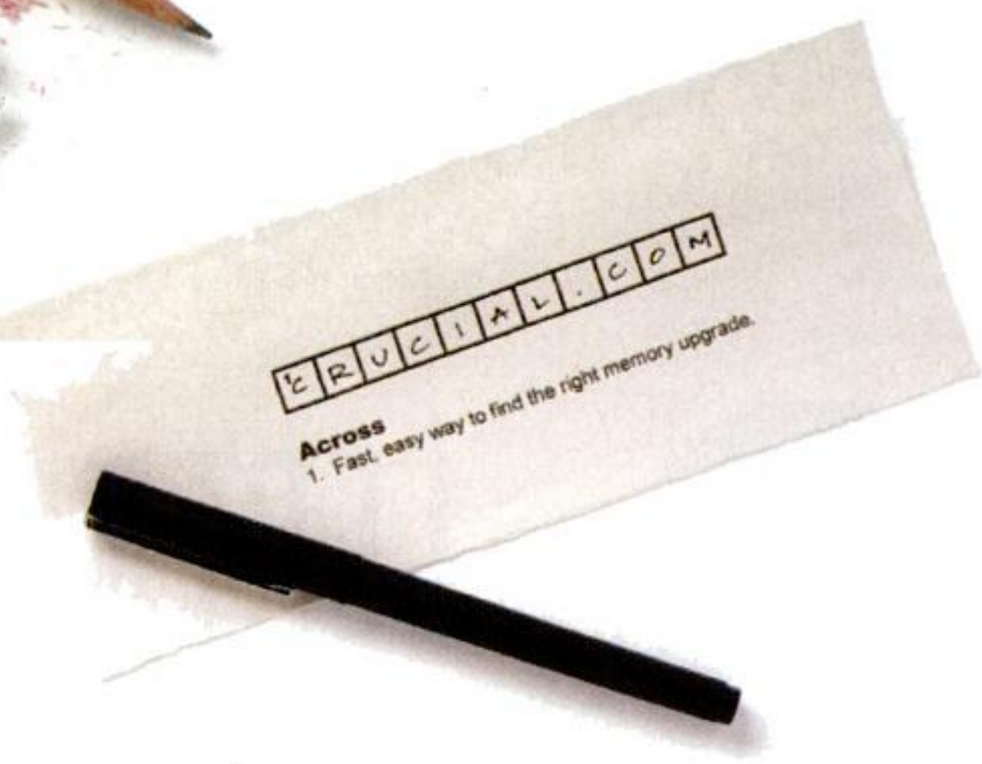

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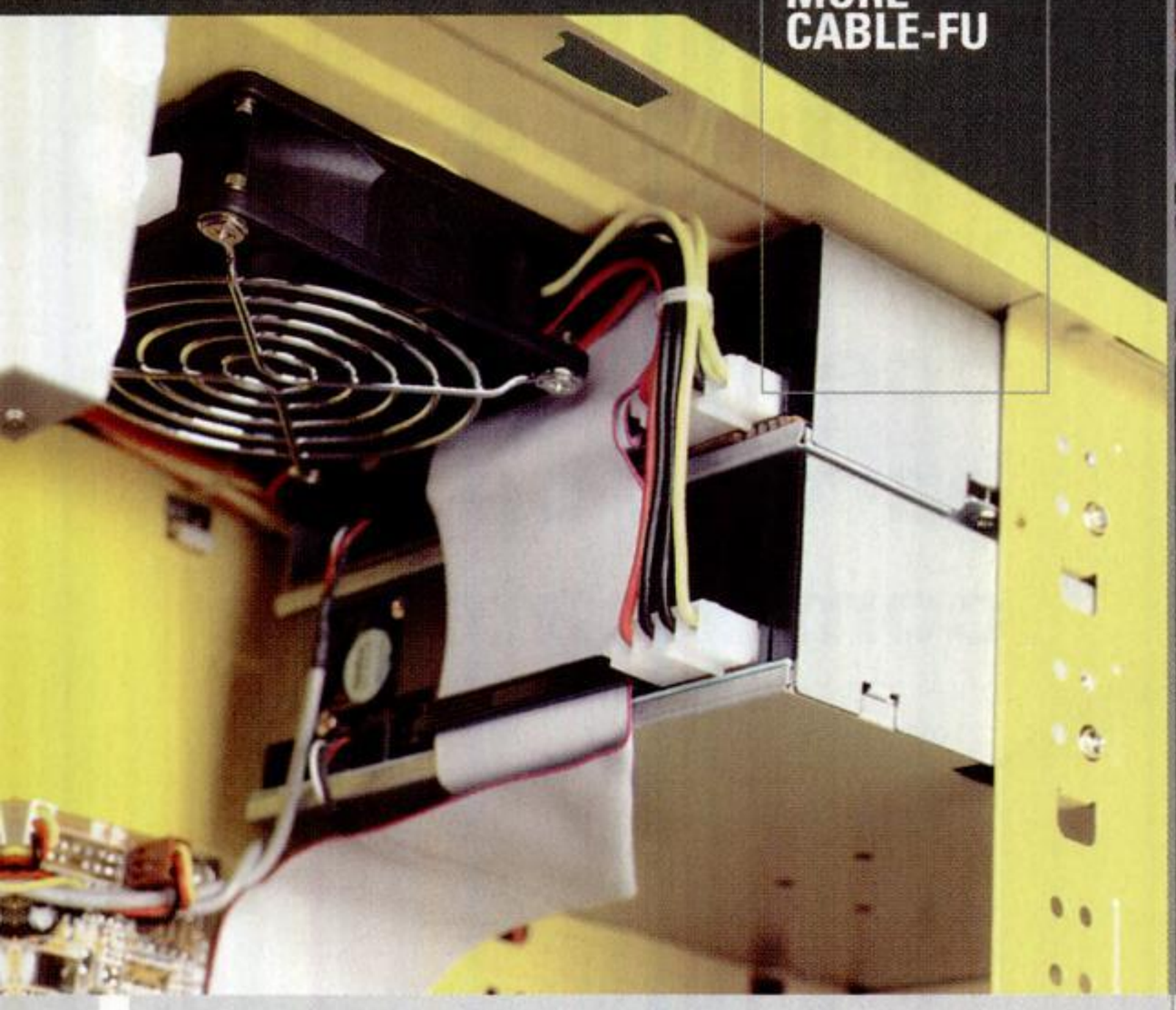
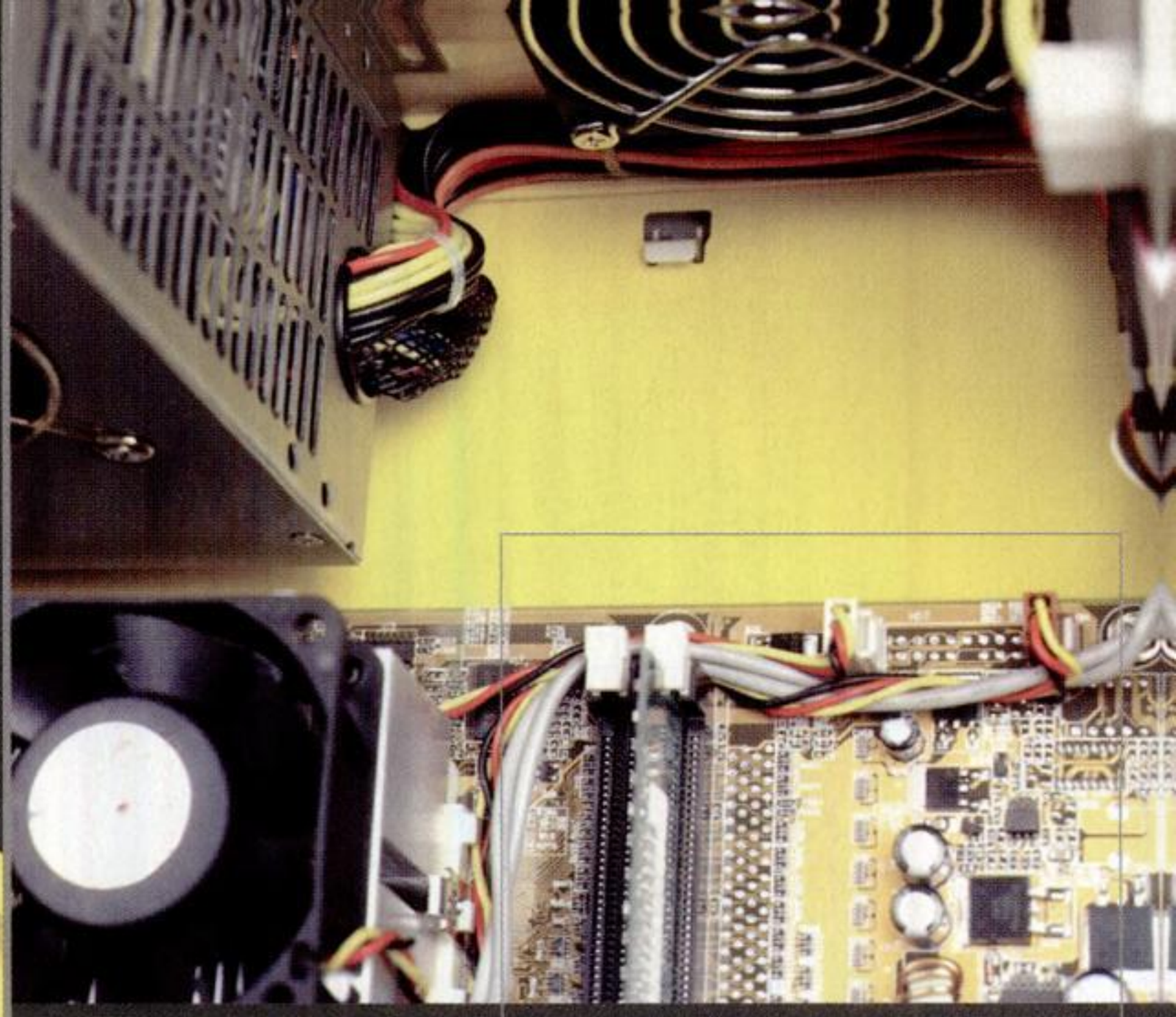
Cables in Voodoo systems are folded at right angles and pressed flat against the drive bays and case. Origami master Jiazeng Shi assures us that, as long as high-quality cables are used, it's OK to unfold and refold them as long as you don't kink or crimp them. Sood told us that Voodoo's initial tests on rounded IDE cables demonstrated a tendency for data corruption.

MORE CABLE-FU





MORE POWER TO YOU

Voodoo uses a custom power supply that has a loom covering the bulk of the cables, and most of those cables have been extended. The extra length allows Voodoo to run the cables along the motherboard and affix them with a few clamps that have been drilled into the mobo by Jiazeng Shi's team.

LEGEND of ORIGAMI MASTER

MAYBE YOU'VE MASTERED THE ANCIENT art of making a crane out of a piece of paper, but until you can turn a garden-variety IDE cable into a miniature tank, you've got nothing on Jiazeng Shi, Voodoo's own Origami Master.

Born in Beijing, China, Jiazeng worked in the Chinese government Patent Office until 1999. "Before the Cultural Revolution, it was difficult for a young man to stimulate his mind," Jiazeng says. "I loved to read, and I read anything I could get my hands on. The books would make me think about ideas that I

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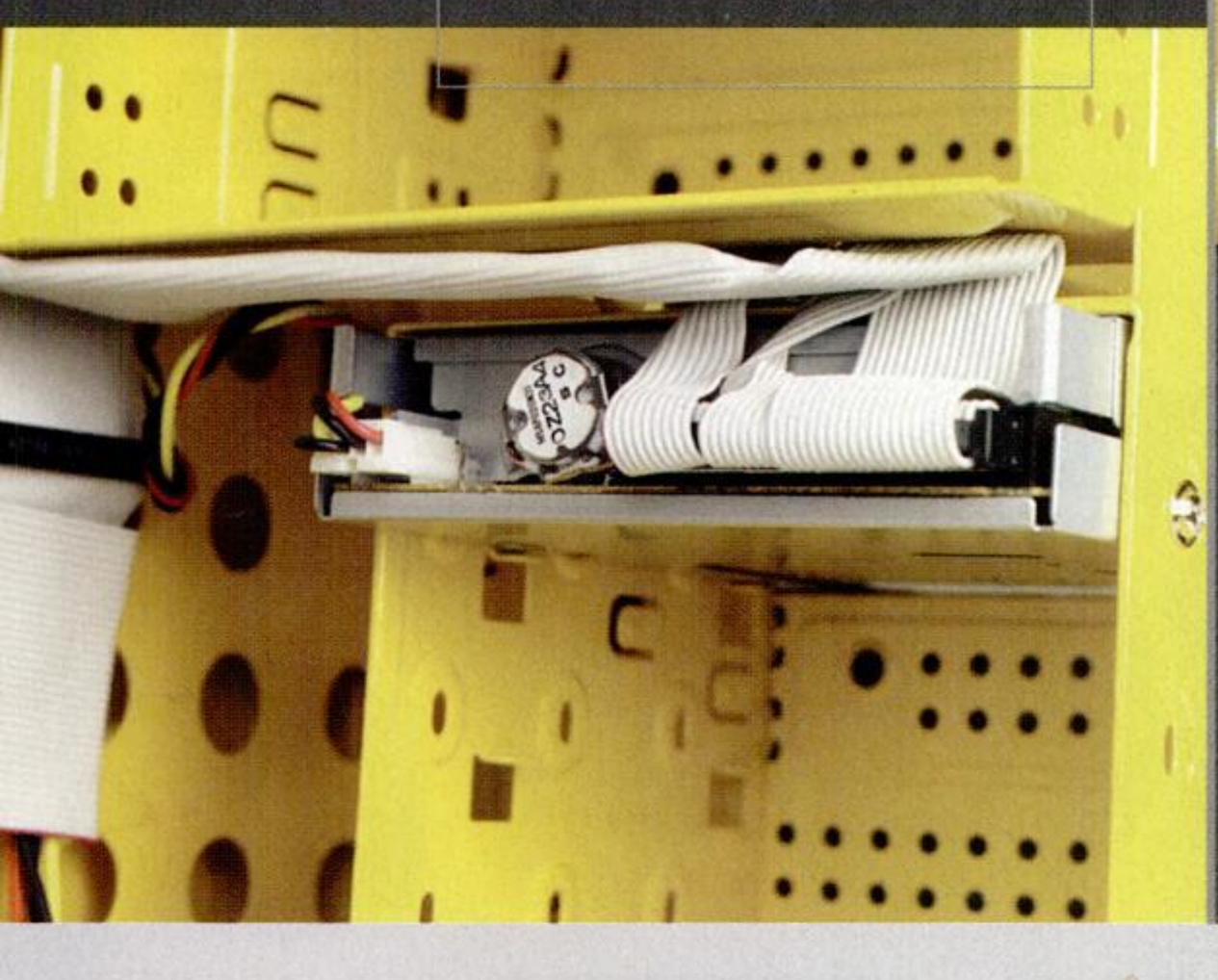
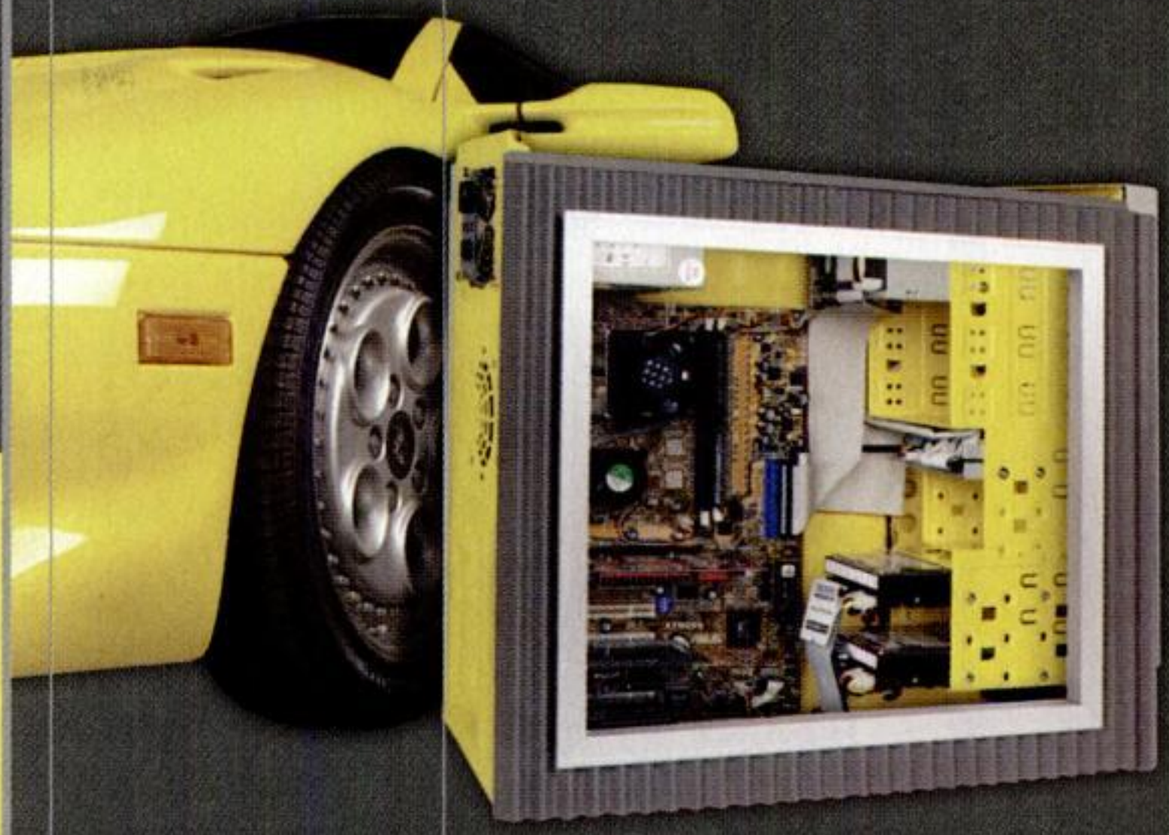
Floppy cables present a challenge to the super-tidy. They're flimsier than IDE cables and have a twist at the end that doesn't take well to being pressed flat. Here, Jianzeng Shi solves the problem by carefully twisting the cable underneath the empty drive bay. Once again, it's important to stress that the Voodoo team never resorts to glue and Fun-Tak—a few tucks into the gaps between drive bays keeps the cables firmly placed.

TAMING THE FLOPPY



COLOR THEORY



For its case exteriors and interiors, Voodoo uses colors that are found on the swankiest of sports cars. In fact, the paint comes from the same companies that deliver signature shades to the top-tier auto manufacturers. Pictured here is Lamborghini yellow. Bugati blue, Ferrari red, and Porsche black are also available if that's what you've got in the garage.

could improve on. I would see a picture of a tank or something in a book, and I would say to myself, 'I could make that!' It gave me great satisfaction in those very oppressed times, that I could make something out of nothing, with only my own two hands."

Concerned that their bright 6-year-old daughter might be stifled by the Chinese educational system, Jiazeng and his wife moved to Canada, where Jiazeng was courted by Voodoo Computers. Says Rahul Sood, "Voodoo was looking for a 'Master Craftsman,' someone junior technicians could apprentice under, and Jiazeng seemed to have everything we were looking for. He's an absolute freak when it comes to order. You wouldn't believe the look on the electrician's face when Jiazeng asked him to fold all the cables going into our lab's electrical panel at a 90-degree bend before they went into the panel."

While no one at the company was willing to confirm or deny the use of actual voodoo rituals in the construction of its PCs, we did find out how the intricate cabling arrangements are executed. Jiazeng told us, "I simply look for the shortest, most efficient path to the source, and if I don't like what I see, it gets re-done from scratch."

After all its components are installed, including the power supply, a system is then mapped out on paper to experiment with different cabling layouts. "I am thinking about the last computer I built and how I can make this one better, and that I want this computer to be beautiful and special. It's easy to look at something that's not broken and say that it works, but the difference is in always believing you can do something more," Jiazeng says.

It's hard to imagine a more appropriate place for Jiazeng than Voodoo Computers, whose own high standards and perfectionism border on maniacal. For his part, Jiazeng is extremely fond of his residence in Canada "because I can throw water balloons at my boss on his birthday. In China, you would never get away with that." In fact, Jiazeng told us if he weren't busy turning cables into soft sculpture for PC purists, he might like to work for the Patent Office in Canada. "The greatest joy about working at the patent office [in China] was that I was able to see new ideas about almost everything in the world, every single day." ■

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We've beta-tested the living daylights out of Microsoft's upcoming operating system—and now it's time to share everything we've learned from our six-month investigation. Product activation. MP3 encoding. Faster boot times. ***The scoop on all this and more, inside...***

The 10 Most Important Things You MUST KNOW About WINDOWS XP

by WILL SMITH

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1 WINDOWS XP COMES IN TWO SIZES

Before you upgrade, you have to choose the best upgrade version

SINCE THE LAUNCH OF WINDOWS 2000, Microsoft has pushed different OSes for use at work and at home. The NT-based Win2000 was your "business OS"—it was developed to ease the management of multiple PCs. Windows 98 and ME were your "consumer OSes"—they were optimized for gaming performance and newbie-friendliness. And even though Win2000 and Win98/ME share a common user interface, the core technology behind the OSes is very different. The business OS is based on the pure 32-bit WinNT kernel, while Win98/ME runs a bastardized melange of the 16-bit Windows 3.0 kernel, 32-bit code from Windows 95, and a little DOS tossed in for good measure.

Flash forward to the here and now. XP combines the stability of the WinNT kernel with the gaming performance of the Win98/ME kernel. The result is a single, robust, user-friendly package. But, of course, there are still two versions of XP, the Home Edition and the Professional Edition. Aside from cost differences, the more expensive Pro version has three main features that the Home version lacks.

First, XP Professional enables a PC to join other WinNT, 2000, and XP computers in a WinNT domain, and allows system administrators to remotely maintain the computers in the domain. The Home version omits this feature.

Second, the Home version of XP lacks support for dual processors. Microsoft doesn't believe dual-proc support is a feature that home users care about. With CPU speeds approaching 2GHz and prices at an all-time low for even the fastest processors, *we're* even starting to question the use of dual processors for regular-old gaming, web surfing, and text entry. After all, how many games, web browsers, and word processors support SMP? Exactly. Regardless, if you want to use that second processor, grab a copy of XP Professional.

Third, each OS version has its own upgrade path. If you want to upgrade from NT4 or Win2000, you'll have to buy the Professional version. Users upgrading from Win98, 98 SE, or ME can use XP Home or XP Professional. Win95 users take note: There is no upgrade from 95 to XP! You'll need to do a clean install of XP, then manually restore your files and applications to the new partition.

Regardless of your current OS, we recommend that you always do a clean install of WinXP and take advantage of the new Migration Wizard, which copies your Windows profile (including desktop icons, mail, contacts, and so on) from your old computer to your new computer. Bottom line: Unless you're planning to pick up a second CPU for dual-processor lovin', or your PC is part of an army of identical PCs managed by a dude with "Sys Admin" in his title, you can probably grab the Home edition with utmost confidence.

Note: Pricing for both versions of XP was undetermined as of press time.

Windows XP is especially clever when it comes to file access. Pictured here is the My Music directory, complete with album cover art in lieu of boring folder icons.

2 WINDOWS XP IS A MEDIA WHORE!

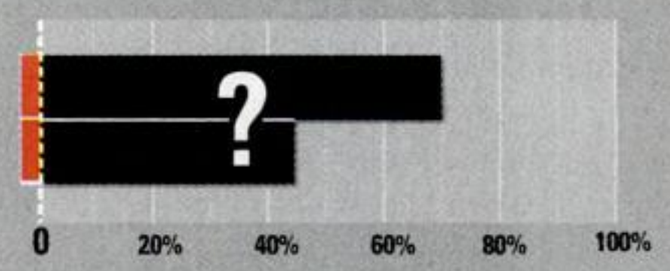
Uh, this may be what the Justice Department was worried about...

ONE OF THE FIRST THINGS WE NOTICED about WinXP is that it's smarter than previous Windows versions. More precisely, when you introduce the OS to a new piece of media—be it a CD-ROM, DVD, Zip disk, or any of the removable memory formats—WinXP examines the content of the disc, drive, or card, and tailors its Windows interface to suit the files that are on the media. For example, if you insert a CompactFlash card full of digital photos, the My Pictures interface—complete with rudimentary photo-editing features—pops up. When you insert a CD-ROM full of MP3s, Windows Explorer invokes a *Windows Media Player* interface. In short, WinXP will launch the appropriate media-savvy Explorer window for music, image, and video files.

A customized Explorer window certainly isn't going to change the world, but it does make day-to-day computing tasks easier (and it doesn't require any additional work on the user's part). This level of media-savvy is one of the things that makes XP such an intriguing upgrade proposition. For what it's worth, during testing, all of WinXP's integrated media tools worked as advertised.

benchmarking XP

As of press time, Microsoft was still on track to release Windows XP to computer manufacturers on August 24 and to regular-old consumers on October 25. If all goes according to plan, we'll be providing comprehensive WinXP benchmarking results in next month's issue. Stay tuned!



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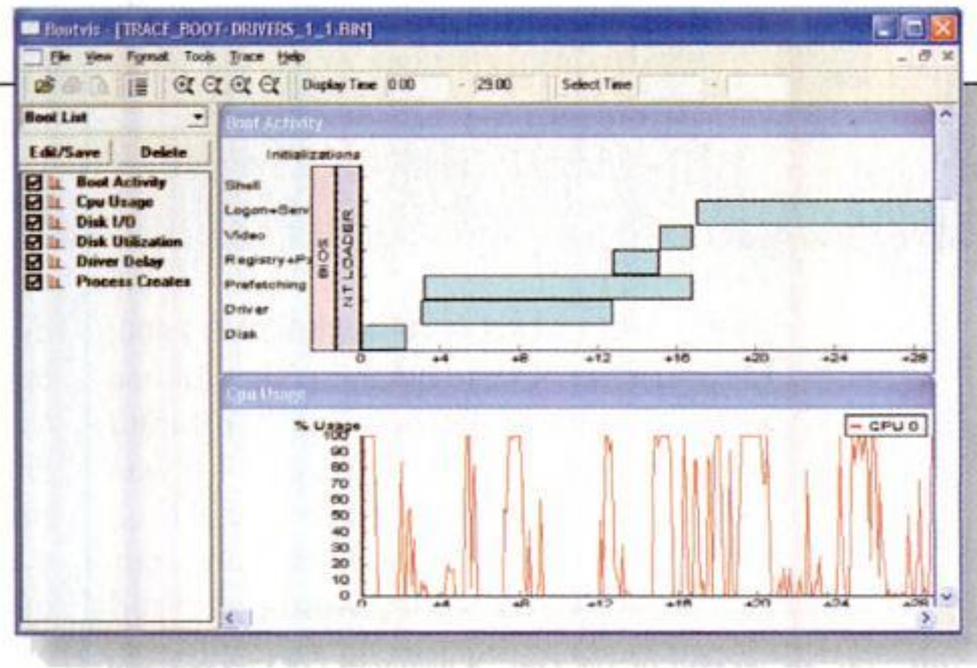
3 FASTER BOOT TIMES!

The long, long waits may be coming to an end...

THE PC CAN'T ENTER THE FRATERNITY OF consumer electronic devices until its boot times improve. Indeed, while a 30-second boot time is pretty speedy for a PC, it's abysmal for a TV or DVD player. With WinME, Microsoft introduced a 30-second boot-time target—and so the trend continues with WinXP. The target boot time for WinXP desktop machines is 20 seconds (that's 20 seconds *after* the computer's BIOS finishes initializing).

In order to get the fastest boot times with WinME, you often needed to buy a whole new computer with a fast-booting BIOS. But over the course of the last 12 months, systems that ship with fast-booting BIOSes have become the standard rather than the exception. This spells good news for WinXP upgraders—you already have one half of the fast-boot-time equation. So how does WinXP execute the other half of the equation? Well, every time the OS boots, its kernel monitors the load times of everything from device drivers to Startup group items. WinXP analyzes the boot logs created from this monitoring and works to improve the machine's boot time by intelligently preloading OS components and drivers into system memory, so you don't have to wait for them to load from your dramatically slower hard drive. Every three days, WinXP also optimizes the placement of essential boot files on the hard drive, arranging them in groups on the inner edge of the drive so the drive can use its maximum burst speed to transfer the data to memory. WinXP is also able to initialize multiple hardware components at the same time, instead of starting them one after the other.



***Bootvis*, which shows you what the holdup is when you boot XP systems, includes a timeline showing the load times for the different OS components (top) and a graph showing CPU utilization (bottom).**

So, what if you build your own box? Previously, the tools that system manufacturers used to optimize their boot configurations were top secret and unavailable to the do-it-yourself crowd. With WinXP, however, Microsoft is setting an awesome new precedent: The boot-time analysis program, *bootvis*, is now available from the Microsoft web site. It graphically shows what components load, when they load, and how long they take to load. Most importantly, *bootvis* helps you pinpoint misbehaving device drivers and system components. Unfortunately for Win98/ME hold-outs, *bootvis* only works with WinXP. The utility can be found at **www.microsoft.com/HWDEV/fastboot/**.

4 I WANT MY MP3s!

Pipe down, Elroy—you can have your music and eat it, too

LATELY, ONE OF THE MOST POPULAR questions in our in-boxes has been "Does Windows XP support MP3s?" The answer is: yes and no. When WinXP ships, the integrated *Windows Media Player 8* software will rip and encode only WMA files (though it will play both WMA and MP3 files). However, all your third-party MP3 ripping and encoding software will work just as it does in Win2000 and WinME. We tested *MusicMatch Jukebox* and *Real Jukebox* just to be sure, and both worked fine.

That's not to say that *Windows Media Player* will never again support MP3 encoding. In October, shortly after the official WinXP launch, Microsoft will release an MP3 Creation Pack that provides *Windows Media Player 8* with MP3 support. What's more, when WinXP ships, *Windows Media Player* will include some new nifty features. For example, when you're ripping a CD, the software will be able to grab actual album-cover art from an Internet database and assign that image as the icon for the appropriate folder in My Music. In real-life terms, this means that when you insert the CD *Abbey Road* into your computer, not only will your machine grab its track information from an online database, it will also grab the picture of the Beatles walking through the crosswalk, and automatically associate the image with the folder that contains the album tracks. Perhaps even better, the software will grab song lyrics from the net, if they're available.

Despite these swanky features, we still contend that people who are serious enough about digital music to download Microsoft's MP3 Creation Pack would probably eschew *Windows Media Player* for a more powerful ripper/encoder.

INTEGRATED CD BURNING 5

But you'll still need third-party software for advanced tasks

EVER WONDERED WHY Windows doesn't include its own app to burn CDs? So have we. Sure, *Windows Media Player* will let you burn an audio CD, but we've always felt that Windows should include the basic ability to toss a few files onto a piece of optical media without any problems.

Luckily for us, WinXP includes support for rudimentary CD burning. While the included burning app doesn't have many of the advanced features we expect to see in a retail product—such as CD-to-CD copying and on-the-fly MP3 decoding—it's great for tossing files onto a CD-R to transfer them among computers. WinXP reliably burnt discs at our two test drives' maximum supported speed, and mastered data discs without any problems. It's as simple as dragging the files you want to burn onto your recorder's icon in My Computer, then pressing the "Write Files to CD" button. The burning app doesn't use packet writing to burn individual files, so you should be able to read the burned discs in almost any CD-ROM drive.

Don't expect features like disc-to-disc copying or automatic MP3-to-WAV conversion, but XP's integrated CD burner makes tossing files onto a CD as easy as pie.

A caveat: When we installed Roxio *DirectCD*, a third-party packet-writing app, WinXP spit back an error message telling us *DirectCD* was incompatible with the new OS. It seems that WinXP disables *DirectCD* to avoid any catastrophic, OS-wrenching problems. We expect to see fully compatible versions of both *DirectCD* and *Nero* (Ahead Software's CD burning suite) shortly after the release of WinXP in October.

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6 THE NEW INTERFACE

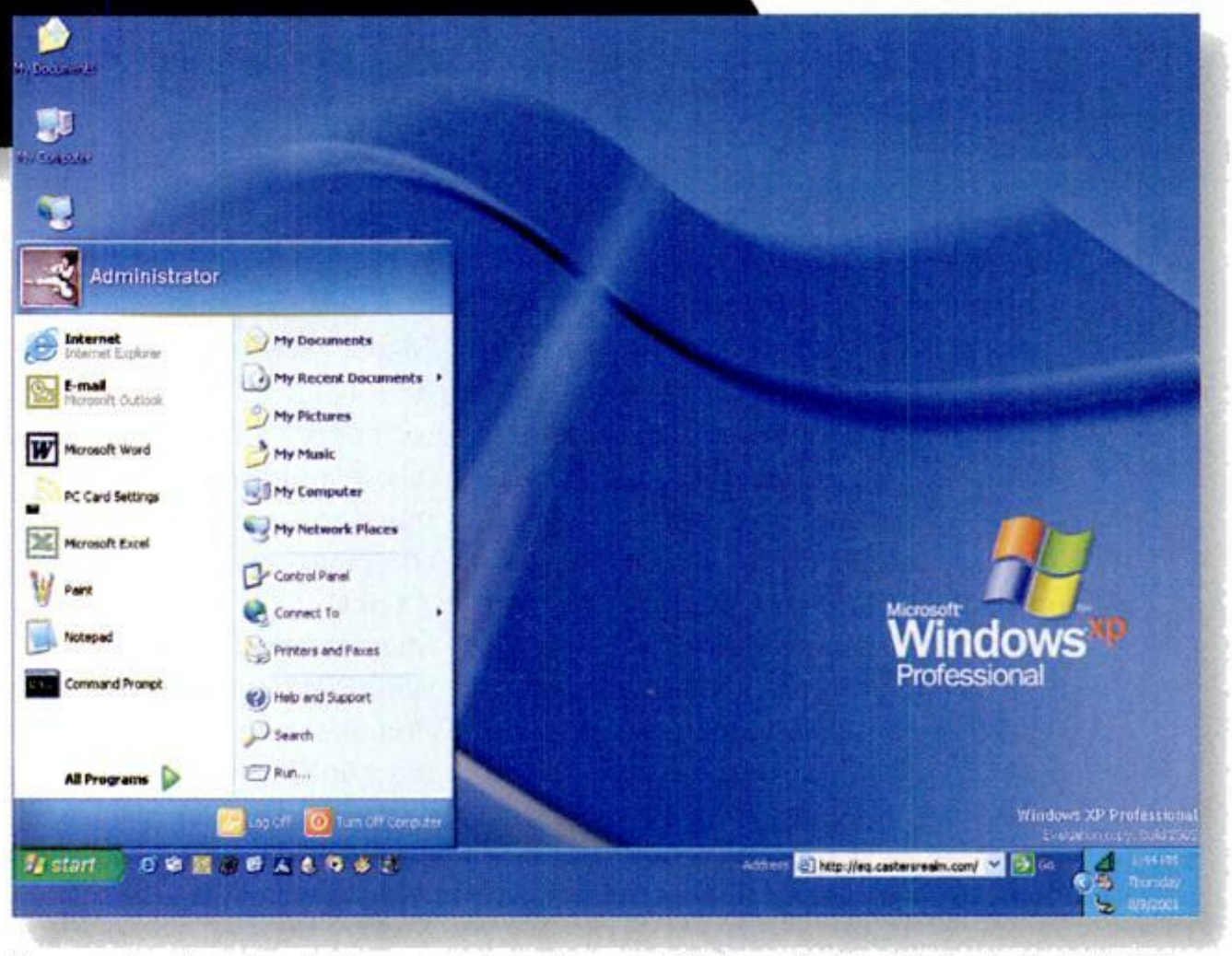
Bigger, better, up front and personal

THE FIRST THING YOU'LL NOTICE ABOUT WINXP is that the Windows user interface, or UI, has been completely redesigned for the first time since Win95. Why mess with something that's worked fine for the past six years? Simple: The Win95 interface was designed to be used with 640x480 and 800x600 desktop resolutions. Today, even the cheapest monitors support 1280x1024 at reasonable refresh rates, and even newbies go with 1024x768 as their default desktop resolution. So, clearly, the new Windows desktop layout needs to keep pace with changing times. In specific terms, this means making Windows' UI elements more suitable to high-resolution desktops.

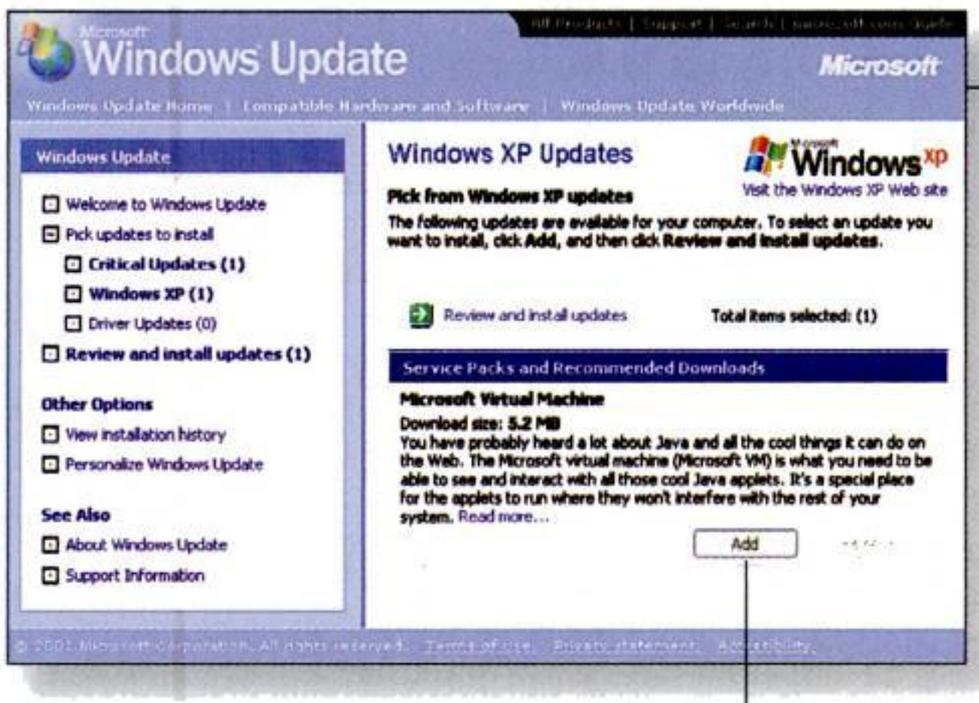
This is where Luna comes in. Luna is Microsoft's codename for XP's updated UI. It includes larger icons, larger default text sizes, and larger buttons in the upper right-hand corners of individual windows. Sure, you could make all these elements larger in the old UI, but not without considerable tweaking—and even then, desktops never looked quite right (just ask some of the folks who followed the tip in Dick Matthews' July 2001 column).

Luna's single biggest improvement is its dramatically redesigned Start Menu. The old, static list of Programs, Favorites, Documents, et al has been pushed to the side. Replacing this list is a dynamically created roll call of the applications you use most. If your daily routine consists of firing up *Word*, *Excel*, *Photoshop*, and *Counter-Strike*, then those four apps appear front and center in the new Start Menu. If you drop *Counter-Strike* as your favorite multiplayer diversion and go back to *Unreal Tournament*, you'll see *Unreal Tournament* in the rankings after a few days. How does Windows work this magic? It's quite simple, really. WinXP monitors how frequently you start different applications, then moves the actual locations of the frequently used executables to the inside edge of the hard-drive platter, where seek times are lowest. This makes the frequently-used apps load faster; once the OS knows what your favorite apps are, it's easy to dump them into the Start Menu.

WinXP is chock-full of other UI changes too numerous to detail here. In future issues of *Maximum PC*, we'll do our best to reveal its innermost secrets.



The new Luna interface is the most obvious change to Windows XP. Don't be fooled by its bubbly appearance—there are significant new features hidden behind its bright fanfare, such as a more intelligent Start Menu and a customizable system tray.


Windows Update
Microsoft
Windows Update Home | Compatible Hardware and Software | Windows Update Worldwide
Windows Update
Welcome to Windows Update
Pick updates to install
Critical Updates (1)
Windows XP (1)
Driver Updates (0)
Review and install updates (1)
Other Options
View installation history
Personalize Windows Update
See Also
About Windows Update
Support Information
Windows XP Updates
Windows xp
Visit the Windows XP Web site
Pick from Windows XP updates
The following updates are available for your computer. To select an update you want to install, click Add, and then click Review and install updates.
Review and install updates
Total items selected: (1)
Service Packs and Recommended Downloads
Microsoft Virtual Machine
Download size: 5.2 MB
You have probably heard a lot about Java and all the cool things it can do on the Web. The Microsoft virtual machine (Microsoft VM) is what you need to be able to see and interact with all those cool Java applets. It's a special place for the applets to run where they won't interfere with the rest of your system. Read more...
Add

7 FEAR, UNCERTAINTY, AND DOUBT

Lies—damned lies—and you'd know as much if you took the time to ask

OVER THE YEARS, THE ALTERNATIVE OS CROWD HAS ACCUSED Microsoft of intentionally spreading FUD—fear, uncertainty, and doubt—about alternative OSes. Not surprisingly, many alternative-OS users have spent much time spreading anti-Microsoft FUD across the Internet. Lawsuits have been filed, and consumer advocates who've never even touched a mouse have been worked into a tizzy. We've discovered a few real problems with WinXP, but most of the features that people fear actually fall into the FUD category. Here's a look at the three biggest controversies:

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1. JAVA SUPPORT: The rumor is that WinXP doesn't—and cannot—support Java because its integrated browser, *Internet Explorer 6*, doesn't include a Java Virtual Machine. Thus, web pages that contain Java applets won't run properly when loaded on WinXP machines.

THE TRUTH: True enough, WinXP and *Internet Explorer 6* will not ship with a Java Virtual Machine. However, a JVM is available for download from Windows Update. Once you've updated your browser, you can run Java applets with impunity. Why no JVM built directly into the browser, you ask? You can blame Microsoft's litigious relationship with Sun Microsystems, Java's creator.

2. SMART TAGS: In beta versions of *Internet Explorer 6*, Microsoft introduced Smart Tags—hyperlinks defined by Microsoft that point users to web sites deemed relevant by Microsoft. The problem with Smart Tags is that they're not inserted by site designers. Rather, they're unilaterally inserted by *Internet Explorer*. The concern is that Smart Tags will make their way into WinXP, overshadow the links that designers put on their own web sites, and propagate the Microsoft agenda on every site on the web.

THE TRUTH: Currently, Smart Tags are easily disabled in the *Internet Explorer* Preferences menu. What's more, due to popular demand, Smart Tags will not appear in the final version of *Internet Explorer 6*, which is integrated into WinXP. They will remain in Office XP, however.

3. PRODUCT ACTIVATION: The scuttlebutt has it that you won't be able to upgrade any hardware without first calling—and getting approval from—Microsoft.

THE TRUTH: While we aren't particularly thrilled with Product Activation (Microsoft's new anti-piracy system), we've done some testing, and we're now convinced that it's not the demon it's been made out to be. Product Activation is discussed in detail in the 10th portion of this article.

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8 RAW SOCKETS AND SECURITY FEATURES

You can't walk through the door of a house that doesn't exist

WINXP IS GOING TO ENABLE A new wave of distributed denial-of-service attacks—or so claim gossipy newsgroup denizens, and even members of the mainstream media. In case you've forgotten how it works, computer crackers waging distributed denial-of-service attacks—aka DDoSes—essentially seize control of thousands of computers to flood huge web sites, such as Yahoo and CNN, with junk data. This data flooding effectively prohibits legitimate user page requests from getting through to the sites, thus denying innocent users the services of the sites. During the last few years, most of the machines appropriated in DDoS attacks have been unsecured Linux boxes, which include a more advanced implementation of the TCP/IP stack than Win98/ME, but one very similar to the implementation in WinXP/2000. (Please see our February 2001 White Paper for more information on the TCP/IP stack.)

A "more advanced implementation" is always good, right? In most cases, yes. But a concern put forth by software developer and computer industry pundit Steve Gibson (**www.grc.com**) is that because XP's TCP/IP stack shares Linux's ability to "spoof" (in other words, to supply a fake IP address), the new OS will make it much more difficult to track down the computers responsible for DDoS attacks.

Luckily for everyone involved, Microsoft has integrated a firewall into WinXP. While it's not as easy to use as *ZoneAlarm* or *Norton Personal Firewall*, the WinXP firewall is a stealth firewall, just like *ZoneAlarm*. When an offending computer scans the IP of a firewall-enabled WinXP system, the firewall sends no response, and the haxor tapping the computer for nefarious deeds will simply think the computer isn't there. If there's no computer at an IP address, there's no motivation for a cracker to continue prying further, is there?

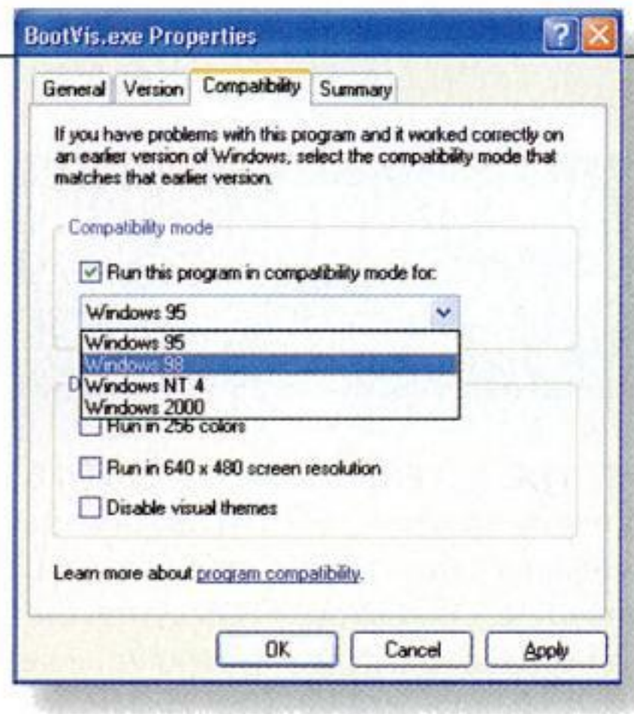
To minimize compatibility issues with Windows File and Printer Sharing, the WinXP firewall is disabled by default. We recommend that the first thing you do after installing the new OS is enable the firewall by going to Network Properties for your connection, hitting the Advanced tab, and checking the "Protect my computer..." box.

On an unrelated note, *Internet Explorer 6*, which ships with WinXP, by default disables cookies attached to ad banners. This stops the large banner-serving companies from tracking your browsing habits. Cheers to Microsoft!

XP's integrated firewall isn't as fully featured as we'd like, but it's easier for a clueless user to enable it than to download and configure *ZoneAlarm*.

9 IT'S THE LITTLE THINGS...

XP's overall shine and polish set a new Microsoft precedent



We were quite pleasantly surprised by XP's Compatibility settings. By configuring XP to mimic Windows 98, we were able to get XP-incompatible apps to run without a hitch.

THE BIGGEST DIFFERENCE BETWEEN WinXP and earlier Windows versions is the new OS's high level of overall refinement. WinXP is chock-full of small but significant new features, and this leads us to believe that its development goals were not only extremely ambitious but also well-executed. For example, WinXP includes the best wireless LAN setup wizard we've seen yet, and its upgraded Compatibility mode has been hospitable to every tired, old application we could unearth from the deep recesses of our software junk heap.

To wit: Configuring WiFi wireless LANs can be a royal pain in the ass. In fact, determining the SSID a new router uses can be a nightmare in and of itself. Not so with WinXP's Wireless LAN configuration wizard. When you plug a WiFi card into your laptop, the OS searches the airwaves and presents you with a list of access points that you can connect to. Whether you're in your living room, a boardroom, the coffee shop on the corner, or somewhere in between, WinXP will seamlessly switch from LAN to LAN without any necessary intervention on your part. The first time you encounter a new network, you're prompted for the network's WEP key. After that, Windows stores the settings and connects automatically.

Bottom line: If you've ever tried switching between wireless LANs at home and work, you're more than familiar with the pain of multiple reboots, manually changing SSIDs and WEP keys, and lost IP address leases. WinXP makes wireless LAN configuration much more palatable.

The same holds true for application compatibility. A number of popular applications and games that ran great in Win98 simply won't work in Win2000. With that in mind, Microsoft's OS development team enhanced WinXP's Compatibility mode to ensure a greater level of application support.

It turns out that most compatibility problems in Win2000 were the result of a relatively small number of errors. To circumvent these errors, WinXP's Compatibility mode tricks games and applications into thinking they're running on Win95, NT4, Win98, or (in some cases) even Win2000. It does this by tweaking Registry key locations, disk access, and a slew of other things. All in all, Microsoft says there are about 200 common error conditions that WinXP is able to anticipate and adjust for. Additionally, there are preset Compatibility modes that you can select for individual applications, which emulate the version info, Registry structure, and file paths for all versions of Windows.

Better wireless support and application compatibility appear to be just the tip of the iceberg. Undoubtedly, we'll discover more polished gems in due time—along with all the other glitches that plague all new OS releases, be they Windows-, Linux-, or Mac-based.

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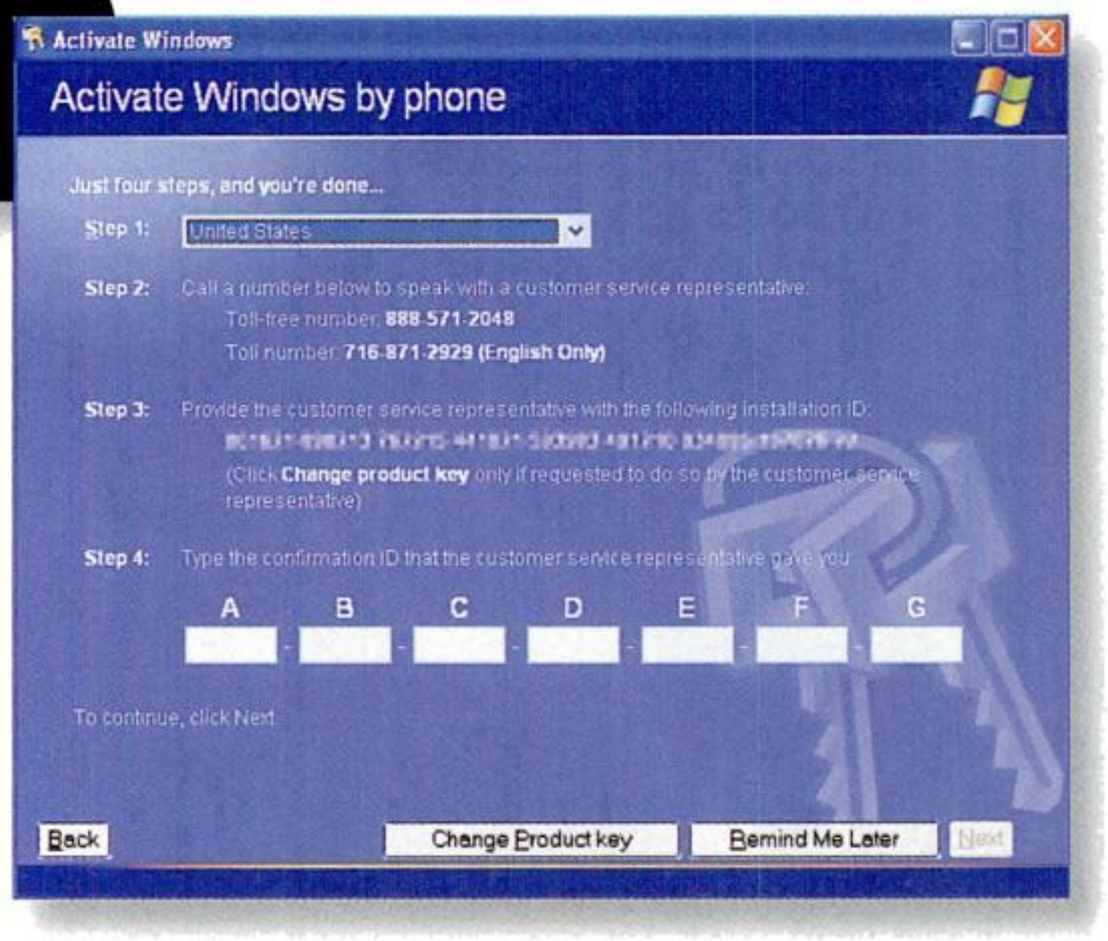
10 PRODUCT ACTIVATION FOR EVERYONE!

And now, we proudly present the controversy you've all been waiting for...


Activate Windows
Activate Windows by phone
Just four steps, and you're done...
Step 1: United States
Step 2: Call a number below to speak with a customer service representative.
Toll-free number: 888-571-2048
Toll number: 716-871-2929 (English Only)
Step 3: Provide the customer service representative with the following installation ID:
(Click Change product key only if requested to do so by the customer service representative)
Step 4: Type the confirmation ID that the customer service representative gave you.
A B C D E F G
To continue, click Next.
Back
Change Product key
Remind Me Later
Next

If you activate XP by phone, you'll be prompted to call a toll-free number and read a 50-digit installation ID. Then you'll be given another long number to activate the OS. Or you can activate over the Internet in three seconds. It's up to you.

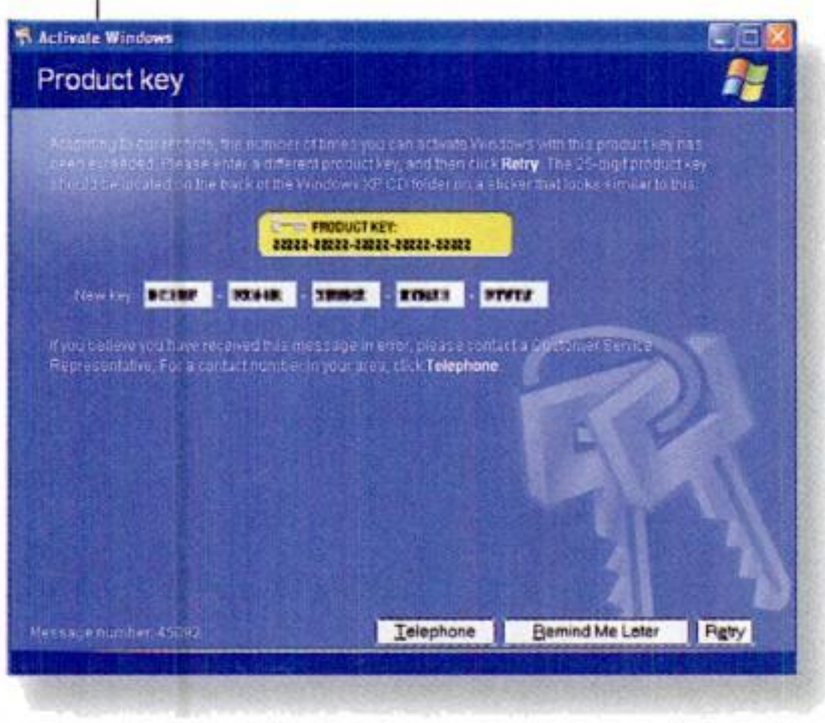
BY FAR, MOST OF THE QUESTIONS WE'VE RECEIVED ABOUT XP concern Product Activation, the most harmful, un-American, earth-shattering scourge ever introduced to computerdom. Lawsuits have been filed, firstborn sons have been promised to pagan gods, and fire and brimstone hath rained down from the heavens.

Well, at least lawsuits have been filed.

In case you're not hip to what it's all about, Product Activation is a new step that Microsoft has introduced to the Windows registration process. Its goal? To combat the rampant piracy that's plagued previous Windows versions.

Here's how it works: Product Activation takes two numbers—the Windows XP Product Activation Code (formerly known as the registration code) and a Hardware ID number (generated by analyzing the hardware in your system)—and combines them into a 50-digit number that's sent to Microsoft. If your machine is connected to the net, the 50-digit number will be sent to Microsoft automatically. If you're a net-hating Luddite, you'll have to call Microsoft and supply a phone rep with the 50-digit number. Regardless, once Microsoft has your code, it will supply you with a new number that enables WinXP to run past a 30-day time limit.

So how does this scheme actually prevent piracy? Well, when your computer connects with Microsoft's server to activate your copy of WinXP, the server automatically associates your Hardware ID with your Product Activation Code and saves this specific association in its logs. If you attempt to activate the very same copy of WinXP on another PC, Microsoft's server will see you're trying to use the same Product Activation Code on a different computer. The Hardware ID of the second PC won't match up with the one that's recognized by Microsoft's evil server henchmen, and you'll have to call Microsoft and explain why you have two different Hardware IDs with the same Activation Code.


Activate Windows
Product key
PRODUCT KEY:
New key:
If you believe you have received this message in error, please contact a Customer Service Representative. For a contact number in your area, click Telephone.
Message number: 45082
Telephone
Remind Me Later
Retry

Should you "accidentally" install WinXP using your buddy's Product Activation Code, the Product Activation Wizard will allow you to change the code.

Because WinXP will stop working after 30 days if you don't activate it, the scheme should prevent people from "casually copying"—in other words, grabbing a WinXP disc from a pal, then installing it on five different computers.

At *Maximum PC*, we have two concerns about Product Activation: that it will prove to be a pain for people who frequently upgrade their hardware, and that it will allow Microsoft to form a database of users' hardware configurations. These are our initial worries based on what we've read about WinXP, what we've learned from Microsoft engineers, and what we've discovered while running pre-release versions of the OS. We'll be sure to investigate matters further after we receive final copies of the operating system.

For now, the main thing upgraders need to know about Product Activation is that the Hardware ID number is primarily derived from your network card's hardware address, so if you don't frequently change your NIC, your problems should be minimal. The Product Activation wizard also looks at the hardware identifier strings of several other pieces of hardware in your system, including your videocard, hard drive, and IDE controller. (Hardware identifier strings are the sequences of numbers and letters that, for example, tell your OS that your GeForce3 is from Hercules and not Elsa.) Your CPU serial number and memory size are also factored into the generation of your Hardware ID number.

According to Microsoft, in real-life practice you should be able to upgrade six of your monitored pieces of hardware if you keep the same network card, or four pieces of hardware if you want to change your network card at the same time, without having to reactivate Windows XP. Additionally, after 120 days, you can do a complete motherboard-level upgrade of your rig. Unfortunately, we were unable to test Microsoft's claims because the pre-release version of WinXP allows more product activations than the final version of the OS will. Again, once we get our hands on a final shipping version, we'll let you know how our testing goes.

As for our privacy concerns, Microsoft says it "absolutely respects the privacy of its customers and does not ask for any personally identifiable information to activate a product." Apparently, the Hardware ID that's sent to Microsoft is a non-unique number that can be shared by different hardware configurations. Microsoft says that because the algorithm that creates the Hardware ID runs locally on the user's PC, and that the ID number that's generated can't be used to divine what hardware is in a system, there are no privacy issues with Product Activation.

For a detailed analysis of Product Activation, go to Fully Licensed (**www.licenturion.com/xp/**). This group calls itself "an independent and unbiased mediator between software vendors and end-users." Their conclusion is that the algorithm that creates the Hardware ID sufficiently obscures any info about the configuration of a PC. Microsoft has also published its own Product Activation white paper. You can download it from **www.microsoft.com/piracy/basics/xp_activation.asp**.

Where do we stand on the Product Activation issue, you ask? We fully support any business's decision to protect its investment—but not if it truly threatens a user's privacy or affects the ease of his hardware upgrades. If Product Activation forces us to call Microsoft tech support every time we want to install a new videocard or CD burner in a test bed, we'll be a very unhappy bunch of campers. On the flipside, if Product Activation actually eliminates piracy—and thus forces casual users to buy their own copies of WinXP—Microsoft will be able to parlay its increased revenue earnings into lower OS prices for all.

We have some ocean-front property in Arizona to sell you if you believed that one. ■

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When a haxor pays a visit to your PC, will he find your doors wide open? A PC without a security system is as vulnerable to trespassers as a home without locks. So if you have a broadband Internet connection, it's time for a lockdown. Here's everything you need to know about firewalls—and how to stymie an attempted takeover of your PC.

All About

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FIREWALLS

or... How to Keep Out Teenage Haxors!

by ANDREW S. BUB

People do stupid things. Some people pet bear cubs—and promptly end up as the main story on "When Animals Attack." Others leave their broadband PCs unprotected—and promptly fall victim to online snoopers.

It's time to wise up, people! Savvy campers don't touch wild animals, and savvy power users don't run vulnerable broadband connections. The wonder and novelty of the Internet has given way to persistent digital anarchy, where the dangers range from the common mischief of pimply-faced haxors to the serious crimes of professional data thieves. You don't want to get bitten? Good. Then get a firewall. It's practically all the fortification you need. (For a quick education in the sort of mischief you're up against, see the Firewall Dictionary on page 51.)

Unlike garden-variety criminals, teenage haxors (aka hackers or crackers, but not to be confused with "script kiddies") can ply their trade from the comforts of their squalid, dirty-dish-ridden bedrooms. All they need is a few keystrokes to scan the net for vulnerable PCs and networks. In fact, a haxor running port scans is the digital equivalent of a cat-burglar who sneaks from house to house checking for unlocked doors, open windows, and any other sign of domestic carelessness. By leaving a port to the Internet open and unguarded, you're inviting in haxors and giving them quicker, easier access to your files, passwords, and bandwidth. They can steal your address book for mass e-mailings. They can place programs on your computer that record and relay back every keystroke you make. They can even plant executables that disable your computer or wipe clean your hard drive. Worse yet, they can take over your PC and use it for those infamous denial-of-service attacks that have brought giants like Yahoo and Amazon.com to their knees. If you spend a lot of time on IRC, use instant messaging, or run any other application that hands out your IP, you're a sitting duck to haxors.

If you think it's a good idea to keep your windows closed and doors locked when you leave the house, then you need a firewall. *Especially* if you've got an "always on" broadband connection, which is tantamount to having a ground-floor apartment on a dark city block. Both software- and hardware-based firewall products have been available to home users for years, but their adoption has been hampered by tortuous configuration routines and general "ain't-that-a-cute-bear-cub" naivete. So don't be a victim. Let us walk you through the steps of installing, configuring, and using hardware and software firewalls.

Before you erect a firewall, however, you need to plug up some of the holes built into Windows itself. At **www.windowsupdate.com**, you'll find patches for the security holes that wily haxors always target first. This is a very important step—if you don't patch these holes, even a good firewall can't stop haxors from getting in. So please run Windows Update before choosing, installing, and configuring your firewall.

STOPPING THE HACKS IN THEIR TRACKS

Firewalls get their name from the fireproof barriers used in building construction. Should a fire erupt in one room, the firewall prevents the flames from spreading throughout the building. The only vulnerable points are a building's doors. Hardware and software firewalls provide similar protection for your PC by blocking access to your PC and network, or hiding it completely, while closely guarding the doors, or ports, you leave open. Most firewalls use a combination of three methods for patrolling port activity:

Illustration by JAMES BENNETT

Protected material

Damn kids! They'll just keep trying to break in until they find an open port.

...a haxor running port scans is the digital equivalent of a cat-burglar who sneaks from house to house checking for unlocked doors, open windows, and any other sign of domestic carelessness.

- **Packet filtering** – Every packet of data, incoming and outgoing, is "sniffed." Like a digital bouncer, the firewall checks each packet's identification at the door, confirming whether you've actually requested it, or if you've previously authorized all unsolicited packets from a specific program or IP address.

- **Stateful inspection** – An advanced form of packet filtering, stateful inspection not only examines the packet header information to verify safety, but also the contents and context of each packet. This adds an additional layer of protection that would catch, say, a haxor using a fake ID to slip by the door.

- **Proxy service** – In *Escape from New York*, Snake tells the cabbie that he wants to see the Duke. "Nobody gets to see the Duke!" the cabbie tells him. That's because the Duke doesn't want to deal directly with dangerous people. Similarly, a hardware firewall has its own IP address that acts as a buffer—in other words, a proxy—between your PC and the Internet, accepting and relaying packets under its own IP address so that haxors never get to see your real IP address.

HARDWARE OR SOFTWARE?

The primary difference between hardware and software firewalls is that a hardware firewall, as mentioned above, has its own IP address. It's like having a fence around your house that keeps intruders at bay before they get anywhere near your front door. It can protect you by turning away unfamiliar callers, or by masking the presence of your house altogether. Software firewalls protect you by denying (or ignoring) access requests, but the software resides inside your PC, rather than outside your PC, so by the time the protection kicks in, the haxor is already at the front door, so to speak. The decision to use a hardware or software firewall, or even a combination of both, should hinge on what kind of connection you have and what kind of Internet services you use.

Dial-up users are usually safe from many attacks because they're typically assigned a different IP every time they log on. Because their IP addresses constantly change, they're of little interest to IP hijackers who like to continually return to and exploit the same exposed IP address. Along the same lines, dial-up users constantly log off and have very little of the tasty bandwidth that attracts haxors like flies. Still, if you surf for more than four hours at a time on a dial-up, you should be using a simple software firewall, such as Zone Labs' free *ZoneAlarm* (**www.zonelabs.com**). Software firewalls are also appropriate for users who have a single PC connected to the Internet through a broadband connection. Even if you use Microsoft's Internet Connection Sharing to share the connection with other PCs, only the PC connected directly to the Internet needs the firewall software installed.

Broadband users are typically assigned a static IP and tend to leave their computers unattended for long stretches of time. This makes their computers easy to find again and again, which makes them tempting prey. That's why most routers installed with broadband connections have some level of firewall protection built in. If yours doesn't, you can always pop in a hardware firewall yourself or configure a software firewall for each PC on your network. Bottom line: If you run any kind of server from your broadband connection, or if you just sleep better knowing there's more distance between your connection and some anonymous miscreant than a software firewall provides, a hardware firewall is the way to go.

Regardless of whether you choose a hardware or software firewall, it's always preferable to use one that offers "stealth" protection. Some firewalls will respond to a probe of your open ports by returning a message that says, effectively, "go away." Of course, this lets the Limp Bizkit T-shirt-wearing goons know you're there. Stealth firewalls simply ignore the request, concealing your PC's presence on the Internet.

INSTALLING A HARDWARE FIREWALL

We used D-Link's DI-704 Cable/DSL Internet Gateway to protect one of our home networks from hoodlums. In particular, we like its support of PPPoE DSL connections and DMZ (more on that later, online gamers). Most hardware firewall configurations are very similar to the DI-704, which uses a convenient web-browser interface, so you should have no trouble following along with our setup routine at home.

Once you've plugged in your hardware fire-

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wall/router and installed all the necessary drivers (if drivers are necessary), the first thing you'll need to do is enter the router's address (found in the documentation) in your web browser. You'll be prompted for a password. D-Link uses "admin" as the default password, so the first thing you'll want to do is go into the Setup menu and change the password to something as obscure as possible, making it difficult for an attacker to guess his way past it. Obviously, you don't want an attacker accessing your router's settings. That's like leaving a window open within reach of the deadbolt on your front door.

Because the DI-704 is a stealth firewall, all unauthorized attempts to access your ports are ignored. So in order to run servers that require "open doors," you'll need to let your firewall know what kind of requests to expect and at which ports to expect them. For example, on the D-Link Virtual Server page, you can tell the firewall to expect guests at port 21 for FTP server requests or at port 80 for web server requests. Visitors will be allowed access to these ports and these ports only. The DI-704, like many hardware firewalls, includes a "Well-known Services" tab that features a handy drop-down list of pre-configured services.

Some programs, such as online games, video-conferencing applications, and Internet telephones, have trouble with the Network Address Translation used by older routers. Many hardware firewalls have the ability to auto-configure themselves to accommodate these applications, but if you're quite confident that you'll spend a lot of time playing *Counter-Strike*, "video conferencing" (if that's what you want to call it), or operating unrestricted file servers, you should go the extra step and buy a firewall that supports a demilitarized zone, or DMZ. The DMZ creates an area outside of your network, or on a single host PC, that permits applications to access the Internet without being hassled by the packet police.

Many hardware firewalls also allow you to fine-tune access to your PC by creating "rules" for specific users or applications. For example, these rules allow you to block access from an IP address that you know to be hostile or permit full access for yourself from a remote location.

INSTALLING A SOFTWARE FIREWALL

Two of the nicest things you can say about a piece of software is that it works and that it's free. Both of these statements apply to *ZoneAlarm*, though you'll have to shell out some extra cash for the far more configurable Pro version. We also like flashy, feature-packed applications such as *Norton Personal Firewall* (**www.symantec.com**), which is included in the *Norton Internet Security Suite*. Regardless of which software firewall you choose, the first thing you should do after installation is reject the default settings that many of these applications offer. After all, haxors know what these default settings are, too! Instead, you'll want to go straight into configuration mode and establish your own settings.

FIREWALL dictionary

You'll need to know these terms to consider yourself well-versed in firewall parlance.

Denial-of-service: This is the form of attack that usually makes the news. It's also almost always unstoppable. A denial-of-service attack occurs when haxors take over multiple innocent computers and use them to flood a particular Internet server with requests to establish a session. The innocent computers break contact before the requests are fulfilled, which creates unanswerable requests. The result is a bogged-down server that slows or eventually crashes.

E-mail bombs: This is a personal attack that can be devastating. The haxor sends multiple e-mail messages to your machine in order to take your bandwidth hostage and tie up your PC indefinitely.

Hacker: Motivated largely by curiosity, hackers are people who probe computer and phone systems to figure out how they work and what kind of information they hold. Hackers are generally principled and don't cause harm to the systems they invade.

Haxor: Also known as crackers, haxors are the evil twins of hackers. Haxors revel in breaking copy protections, damaging networks, stealing and/or altering data, and generally being unpleasant. They began referring to themselves as haxors, or HaX0rs, to avoid being blocked by ISPs, online services, and message boards that automatically delete references to "hackers."

Macros: Macros are a series of commands built into Microsoft *Office* that can be scripted to do your bidding. Unfortunately, they are easily exploited by haxors and can be pressed into the service of the dark side. Remember "Melissa?"

Redirect bombs: Haxors can redirect the path that information takes by sending query responses to a different router. This is one of the ways that a denial-of-service attack is set up.

Remote login: Haxors use a remote login to connect to a target computer, then take control of it. They can scan the target computer for files, view its contents, and even run programs from it.

Script kiddie: Just below the haxor in the ne'er-do-well evolutionary ladder, script kiddies have little or no technical expertise of their own. Instead, they download virii, worms, and other offal from IRC chat, web servers, and FTP sites, and set them loose on people they have some vague grudge against, or on the public at large.

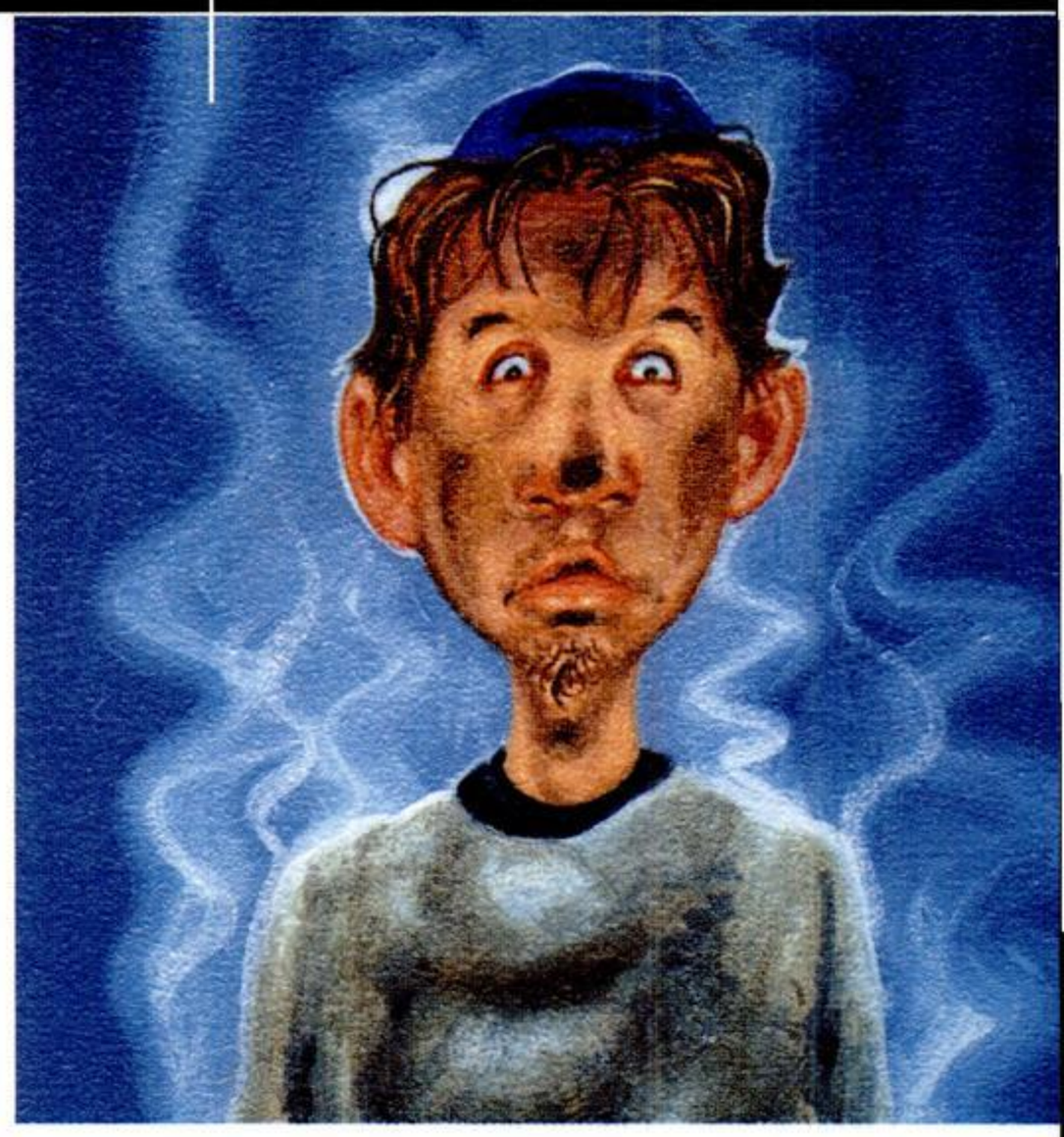
SMTP session hijacking: By redirecting their e-mail—often with malicious payload—through the SMTP server of an unwilling host, haxors can make their spams difficult to trace.

Source routing: This is a way for haxors to mask where a packet is coming from. In a nutshell, they make it appear as if something devastating is actually coming from a trusted source. Most firewalls foil source routing without being told to.

Virus: A virus is malicious code that needs to be executed in order to drop its payload.

Worm: A worm is a malicious self-replicating program. Unlike virii, worms do not require human intervention to propagate. Some worms destroy or corrupt data at random; others target certain types of files (such as documents). "Code Red" is the most famous worm currently being served, but new ones appear all the time.

The idea behind installing your own firewall is to prevent intrusions and attacks *before* they happen, not to moan and groan after your bandwidth is taken hostage.



A good firewall can singe the faces of haxor scum. With some of the best software firewalls available for free, why risk having your bandwidth hijacked?

ZoneAlarm's settings use security sliders similar to those found in *Internet Explorer*'s Security menu (which can be found in Internet Options). Your choices include high, medium, and low security for local (intranet) and Internet access. We recommend beginning with "high" security, at least for Internet access. When you choose this setting, you'll be nagged every time you run an application that attempts to access the Internet. This is a *good* thing. Every Internet client you have—even your innocent little e-mail program—will elicit a warning screen and ask you for permission to send data. This signals your opportunity to selectively grant authorization for the Internet activity *you* deem safe and secure (just remember to check the box that indicates you want your firewall to remember the selections in the future, so you won't be constantly interrupted). You'll have to grant permission for all your Internet applications, one by one, but it's well worth the trouble. After you've authorized all of your Internet clients to send information from your PC to the net at large, you can rest assured that alarms will sound when a haxor's depraved program attempts to send data from your PC to, say, some dubious information clearinghouse in the Cayman Islands.

Norton Personal Firewall can save you some time by scanning your drive for Internet apps that it recognizes and configuring them accordingly. But be extremely vigilant about handing out permission slips. That is, don't just authorize access as a matter of rote because you're tired of seeing that annoying warning pop up again. You don't want to poke holes in your firewall by giving access to apps that don't deserve entry. For example, giving the thumbs-up to ad banners may result in unrestricted access for the little spyware droppings they leave behind.

You might also find that some of your programs are unable to break through the firewall. For example, common programs such as Internet telephony apps can be crippled by having each packet hassled at the gate. Likewise, innocent MP3 file transfers can be blocked as a result of high-security settings. In these instances, you can create custom rules for the applications. *Norton*'s Internet Access Control steps you through the process of establishing what kind of access you want to grant in each instance.

Another fine feature of some software firewalls is that certain documents can be tagged for extra protection. This means you can create a *Word* file called "all_my_passwords.doc" and make it completely off-limits to the rest of the world.

Once your firewall is configured, you'll start to notice attacks. Most are innocent, but as far as your firewall is concerned, they could very well signal the first wave of an alien invasion. Is it a harmless ping from your ISP or a blatant land-grab for your bandwidth? Both *ZoneAlarm* and *Norton Personal Firewall* will alert you to the nature of the intrusion with the option to receive more information.

CHECKING FOR LEAKS

Once you've configured your firewall, you'll want to test your protection by simulating some attacks. We suggest you use Steve Gibson's *Shields Up!*, which can be found at **www.grc.com**. This site will simulate an aggressive attack and port scan on your systems and report the results. You can also download a small program called *LeakTest 1.0* (**http://grc.com/lt/leaktest.htm**). If you run this program, your firewall protection should alert you. If it doesn't, it's back to the config screen for you!

BETTER SAFE THAN SORRY

The truth is that haxor attacks are still pretty rare. Most of the "attacks" a home firewall intercepts are either innocent or minor. For example, ISPs commonly perform port scans of users' PCs to see which IP addresses are being used—and your firewall will trip up such a scan. On the upstream side of things, software such as *MusicMatch Jukebox* will automatically check for updated versions online—and your firewall will want to know why your PC is sending out upstream requests of its own volition. But you shouldn't become complacent because your ISP and MP3-encoding software are just doing their jobs. The idea behind installing your own firewall is to prevent intrusions and attacks *before* they happen, not to moan and groan after your bandwidth is taken hostage. Firewalls ensure that you'll never have to count yourself among the Internet's sorry victims. You know the type—they're the same people who thought that cute little bear would never actually bite. ■

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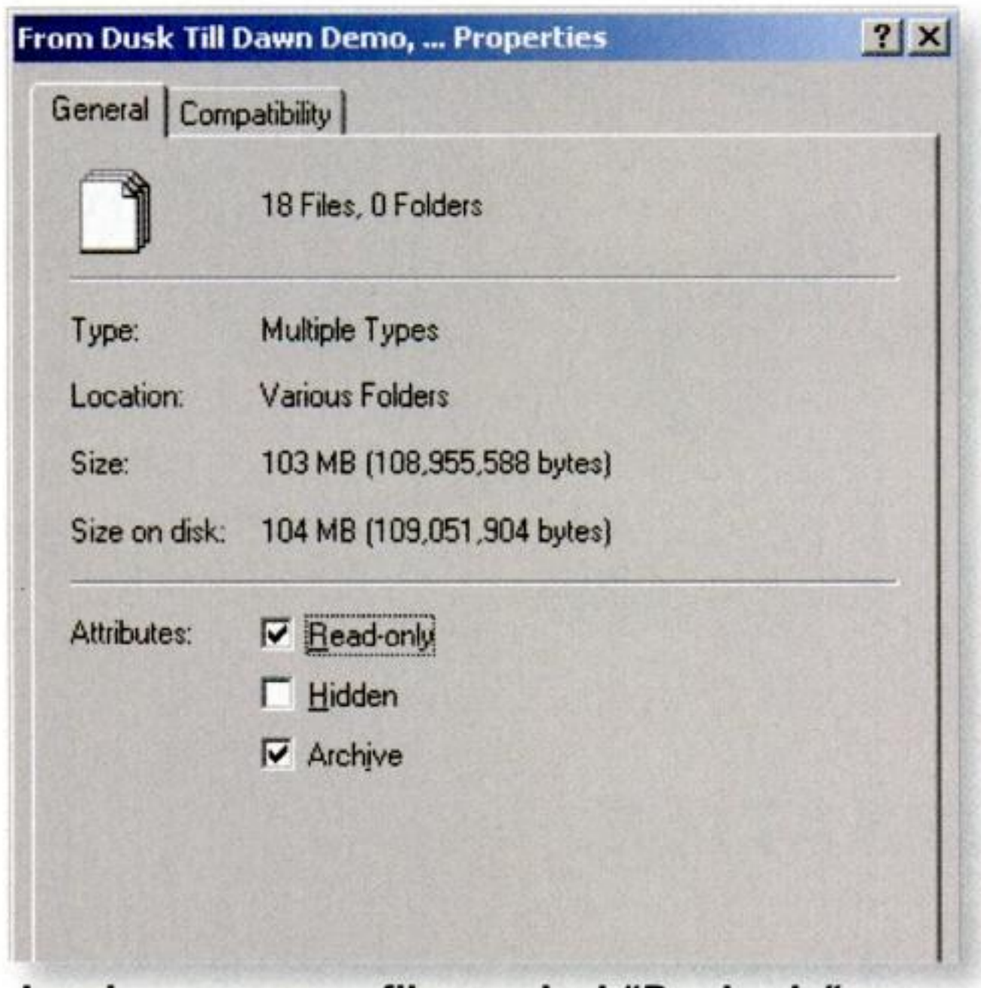
Ask the Doctor

Symptom → Diagnosis → Cure

Even the burliest of PCs comes down with a bug every now and then. That's when you need to call The Doctor and get a diagnosis that'll have you up and running in no time. Send your symptoms to: **doctor@maximumpc.com**. Unfortunately, The Doctor cannot personally respond to every individual letter.

Save Game SNAFU

I was in need of a reformat, so I diligently backed up all my save-game folders and other important files onto CD and reformatted away. Now that I'm up and running again, it seems my save-game files weren't all I needed to back up. I had problems with *Icewind Dale, Roller Coaster Tycoon,* and some others, but my fear truly set in when I fired up *Diablo II.*



Leaving save-game files marked "Read-only" can be detrimental to your sanity.

In *Diablo II,* I can load and play my non-realm characters, but they won't save afterward. So my level 36 slayer assassin is forever level 36, and my level 21 hardcore Amazon, who was ready for Duriel, will never get there. An interesting side effect is that, while using these characters, if I teleport out of an area and then return, the area is clear, as if I'd never been there. Oh, and yes, my new Barbarian, BlizzardSux, works just fine, though I doubt I'll waste 1.5GB of disk space on the game anymore.

I have a feeling that when I go for the *Baldur's Gate 2* expansion, I'll encounter the same problem and see 200 hours of gameplay shot down the tubes. Is this typical of games? Are there super top-secret files that I should have known to back up? Was I crazy to think that every file I'd need was in the "save game" or similarly named folders?

—Captain Corruption

Today is your lucky day, Captain. The Doctor knows exactly what your problem is, and it's not the software's fault, but rather your own error. You see, when you burn files to a CD, they're automatically marked "Read-only" by the OS. When you copy them to your hard drive, the new copies on the drive are also marked "Read-only," which prevents the game from adding any new data to the file. Some games deal with this better than others, but none will work correctly if they aren't able to save new updates.

To fix the problem, you need to round up all the files you backed up to CD, and uncheck the Read-only attribute in the files' properties page. You can do this for all the files at once by Ctrl-clicking each file, then selecting Properties

It's worth noting that many applications will have similar problems with Read-only files. If you try to open a Read-only *Outlook* post office file (it has a PST extension), *Outlook* will scream bloody murder and the paper clip will stop speaking to you for several weeks. (Please try to contain your disappointment.)

Shutdown Hang-ups

I am e-mailing you because of a problem I've had with Windows 98. Almost half the time I shut down my PC, it will just stop at the "Shutting down Windows 98" screen, and the PC will continue running. I've tried many different fixes, but nothing has worked. Can you help me?

—Raymond Ardelan

After a quick jaunt through Microsoft's search engine, we found a Knowledge Base article (support.microsoft.com/support/kb/articles/Q202/6/33.ASP) that provides very specific shut-down troubleshooting tips and a link to the Windows 98 Shutdown Supplement. Moral of the story? Use the Knowledge Base! For people who find this advice confusing, please read August's How To article, "Be Your Own Technical Support Specialist."

Loudmouthed Modem

I read somewhere that you can stop your modem from making the dialing noise when you're connecting to the Internet, but I don't remember how to do it. Can you tell me?

—Manuel Marquez

Some people love hearing the euphonious melodies of a 56K modem, while others consider the modem sounds to be nothing more than mournful wailings—reminders of the inadequacies of their analog connections.

We'd be more than happy to help you steer clear of the shame, Manuel.

Getting rid of the modem tones is as easy as pie (unless you're saddled with a bad modem driver). All you need to do is go into Device Manager to select the Properties for your modem. On the Modem tab in the Properties window, there should be a Speaker Volume slider. Moving this to "Off" should disable the squawk when you connect online.

"...others consider the modem sounds to be nothing more than mournful wailings—reminders of the inadequacies of their analog connections."

The Windows Password Must be Stopped

I'm running Windows 98 on a system I built, and I just can't stand that annoying prompt for a network password before Windows starts! My computer is at home, so I'm not concerned with someone else using

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my system. I just want to be able to reboot, walk away, and then be ready to work when I come back. I don't want to have to enter my password every time I boot Windows. Any help you can provide will remove stress from my already over-stressed life!!

—Roger LaCoco

The Windows Password is an annoyance, especially since it does absolutely nothing for the security of your computer. It's almost as easy to bypass as the password for the magical, mystical OS that hackers are always breaking into in movies. Fortunately, it's easy to get rid of the password prompt in both Win95/98/ME and Win2000.

In Win95/98/ME, the first thing you need to do is open the Passwords Control Panel, then go to User Profiles and select "All users of this machine share the same profile." Before you reboot, head to the Network Control Panel, and remove "Client for Microsoft Networks," which should get rid of the two most common password prompts in Win95/98/ME.

For Win2000 users, it's even easier to nix the password prompt. Just open the Users and Passwords Control Panel, and uncheck the box that says "Users must enter a user name and password to use this computer." The next time you reboot, you won't be prompted to enter a password.

Stop Windows Networking Before It's Too Late!

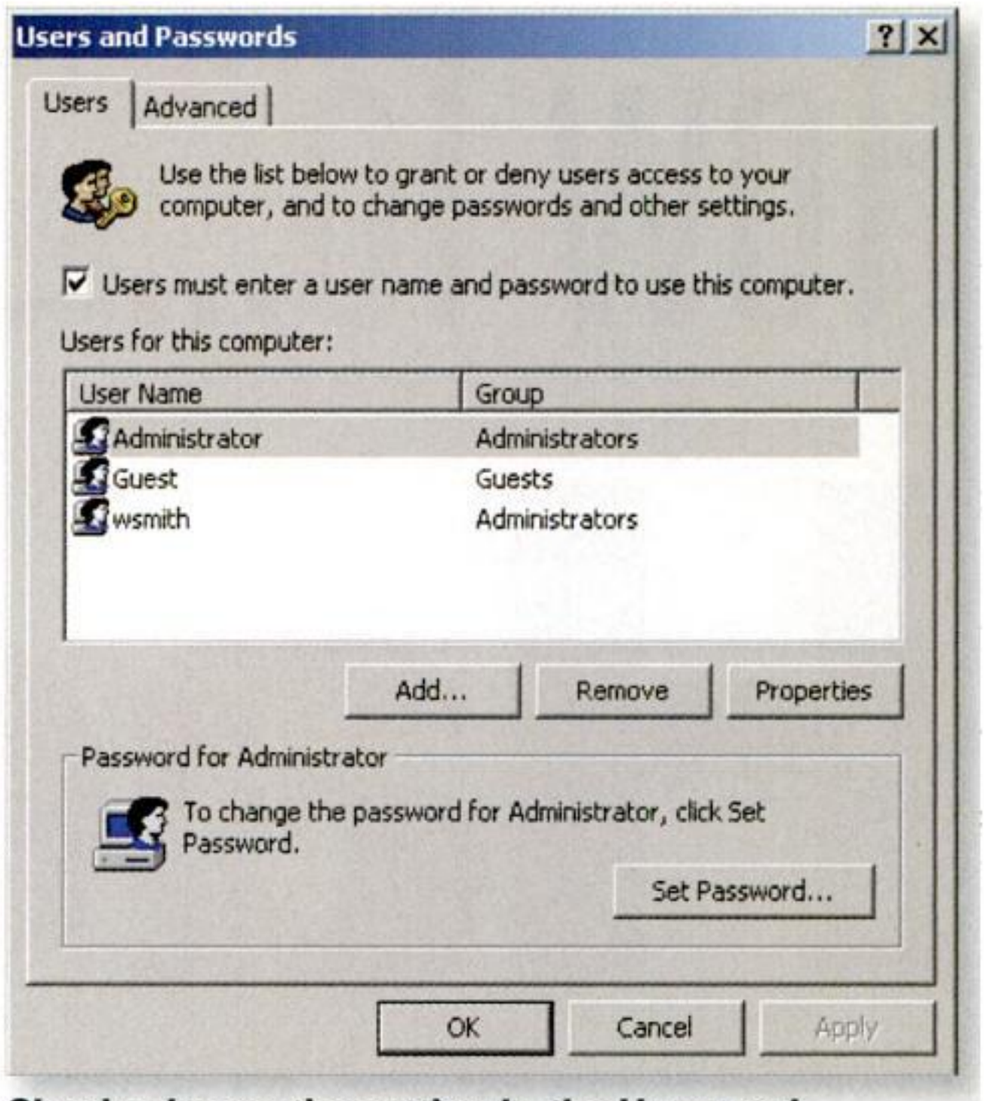
I'm in need of step-by-step instructions on how to remove Win98 networking from my computer. I want to reinstall it because right now I have two Windows login screens that I can't get rid of. If I cancel one of them, then I can't get on my network to get files from my other Win98 machine.

Will getting rid of Windows Networking get rid of both logins? After I get Windows Networking up and running again, I hope to set up one modem to work with all three computers on my LAN.

—Stephen Raines

Actually, you don't need step-by-step instructions to remove Windows Networking. Instead, you need to make your Windows and network passwords match up. After you've made a trip into the Passwords Control Panel, all you need to do is set your Windows login and password to be the same as your network login and password. Either change your network login and password to match your Windows login and password by using the Change Other Password button, or use the Change Windows Password button to make the Windows password match that of your network.

You should also know that you don't need Windows Networking to share a dial-up account with more than one computer. Internet Connection Sharing simply requires a modem, a network card of some sort, and TCP/IP installed on both the dial-up adapter and the network card. This might sound complex, but don't fear: You can run the ICS Wizard to walk you through the necessary steps. ■



Simply change the setting in the Users and Passwords Control Panel to keep from having to enter a user name and password in Windows 2000 every time you reboot.

OVERCLOCKER'S CORNER

Old Mobo Woes

I'm trying to upgrade an old Pentium II 266 system that I use as a secondary box, but I'm running into difficulties. The "new" CPU I've installed is an old PPGA Celeron 366 that I used to run overclocked at 550MHz in a different computer. The latest BIOS for the AL440LX mobo supports up to 433MHz, and I'd like to run this Celeron chip at that speed.

Unfortunately, it's automatically recognized as being 366MHz, and the BIOS won't give me the CPU speed options to select 433MHz. According to the manual, I should be able to manually select any supported speed by simply setting the jumper to Configuration Mode and going into the Maintenance screen in the BIOS, but it currently shows no options for CPU speeds. I assume that's because it knows the proc is a 366MHz chip.

Is there any way to work around this? Granted, 366MHz is better than 266MHz, but when I know this proc will run at up to 550MHz with no problems, it's kind of frustrating having to settle for less than the CPU's max.

—John Meyers

The problem is that the LX chipset your motherboard sports just isn't suited for overclocking. When you plug in the CPU, the motherboard's chipset auto-senses the presence of a P-II 266 and automatically determines that it should be running a 66MHz system bus, the CPU's bus speed as defined by Intel. And because the CPU has a multiplier locked down at 5.5, the proc runs at 363MHz (66MHz x 5.5 = 363MHz).

Perhaps a little background is in order: To keep unsavory types from overclocking slow CPUs and selling them at fast CPU prices, Intel locked the multiplier of all of its processors, starting with the Pentium II 266. This multiplier lock keeps a CPU from functioning if it's inserted into a mobo set at anything but the proper multiplier. Because your Celeron's multiplier is locked at 5.5, you can't reach 433MHz. Or, rather, you can't do so by playing with the multiplier; it just won't go to 6.5.

Fortunately for overclockers, the dastardly multiplier lock doesn't put a total kaibosh on overclocking. By increasing your systems' bus speed, you can still overclock your CPU. Cranking up the system bus isn't without perils, however. Running at an unsupported bus speed (only 66MHz, 100MHz, and 133MHz are officially recognized) can cause system instability. That stated, two Celerons (the 300a and 366) are particularly overclocking-friendly; they have so much headroom for faster speeds, they can actually run very reliably when set at the faster supported bus speed of 100MHz. In other words, you can run a 366MHz Cellie at a 100MHz bus speed for an effective 550MHz clock frequency, all without any pesky instability. The kicker? You will need a motherboard that supports the 100MHz bus speed, and no LX chipset boards do that.

Bottom line: Unless you want to upgrade that old board to a BX chipset or one of the newer VIA chipsets, you're stuck at 366MHz.

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How To...

A step-by-step guide to tweaking your PC experience

Hack YOUR PALM PDA

If you've dismissed the PDA as nothing more than a yuppie toy, you are hereby stripped of your Power User title. *Real* gearheads know better: The PDA is a little PC, people! It's as powerful as a 386, and just as hackable. Though they may not pack as much power under the hood as a desktop PC, current PDAs are equipped with enough memory and processing power to be useful in a variety of capacities. And if your PDA doesn't have enough memory to suit your purposes, don't fret—you might be able to simply crack open the thing and add some more.

On the following pages, we'll show you how to overclock your Palm, turn your PDA into the ultimate universal remote, and pull off a half-dozen other wacky, weird PDA hijinks. They're all real projects that have already been undertaken by regular Joes. That stated, a word of caution is in order: *Some of these projects require multiple steps, not to mention a soldering iron and a better-than-passing understanding of circuitry.* Also, please be aware that some of the hacks require you to actually open your PDA's case—and this effectively voids your PDA's warranty. So don't come screaming to us if you fry your Palm in the middle of a PDA improvement project; the hacks work, but not for everyone. Back up everything, and be prepared to lose your PDA if you attempt some of the more radical tweaks described in this article.

And don't hesitate to write us, admitting how wrong you were for dismissing the PDA from the realm of the PC elite.

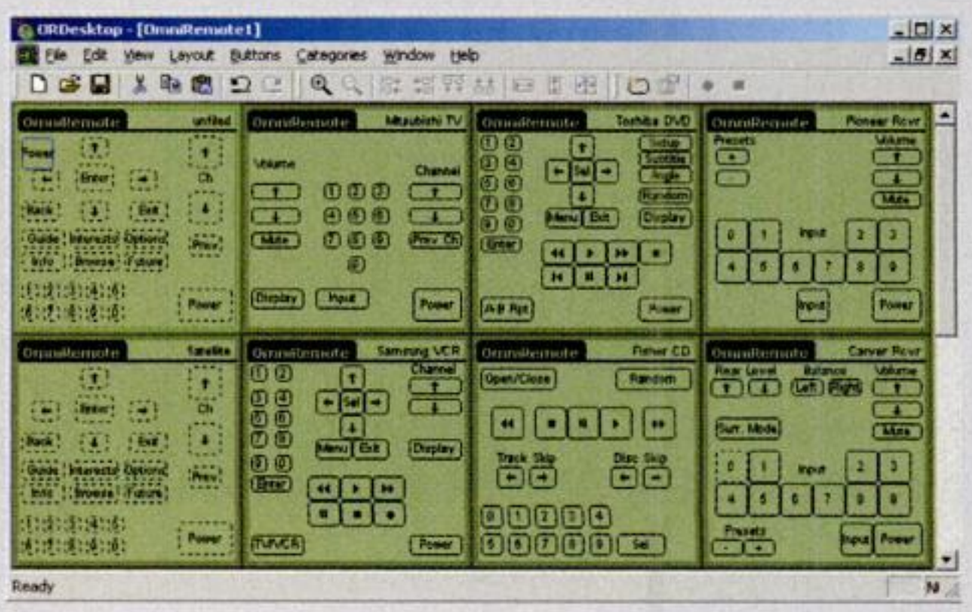
—KRISTEN SALVATORE

Turn Your Palm into a Universal Remote

Using *OmniRemote* software, you can turn most IR-equipped Palms into universal remotes for devices that depend on infrared control (for specific support info, go to the FAQ at **www.pacificneotek.com**). Unfortunately, you'll have to teach *OmniRemote* the functions of every button on every single one of your remote controls. This is a tedious and time-consuming process that involves setting the software to its learning mode, then holding down the remote key until the Palm has picked up the code. You can avoid most of this annoyance by downloading a copy of *ORDesktop* for a mere $20. This companion to *OmniRemote* is a visual editor used on the PC to create button layouts, so you don't have to teach *OmniRemote* one button at a time. Even better, *ORDesktop* offers pre-made layouts for many major manufacturers' remotes, including those from Hitachi, Kenwood, Sony, and Pioneer (you can find specifics at **www.ordesktop.com**). Just download the layout files and install them on your Palm. You can even e-mail the company to request code for other devices.

We also found a treasure-trove of IR libraries, macros, and system files for other universal remotes at **www.remotecentral.com**. Finally, if you're interested in creating your own IR-enabled programs, grab the developer's kit from *OmniRemote*'s web site.

OmniRemote allows you to put together different button layouts for each device you own, as well as program complex macros that perform multiple tasks, such as powering on your receiver, TV, and DVD player with one keypress.



ORDesktop, a companion product to *OmniRemote*, eases configuration of your Palm remote by providing a simple Windows interface for setup.

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Overclock Your Palm

There are a number of applications that will overclock your Palm's processor, but the two most popular are *Tornado* and *Afterburner*. Yes, they really do make your Palm's proc run faster, and, yes, they really can induce the same problems one might experience with an overclocked desktop CPU: Your PDA might hang, display weird characters, burn through batteries at an uncanny rate, or overheat and catch fire. But of course, overclocking your PDA can also get you a faster PDA and those all-important bragging rights. There are a few differences between *Afterburner* and *Tornado*, which we outline below.

Afterburner 2.0

www.gavini.com

This shareware program runs concurrently with *HackMaster*, another add-on app designed to manage Palm "hack" applications. Simply install *HackMaster*, then install *Afterburner 2.0*, then adjust the latter's software settings to overclock at will—no hardware hacks necessary!

The main difference between *Afterburner* and *Tornado* is that *Afterburner* offers faster overclocking settings. In fact, older versions of *Afterburner* would allow speeds to go so high, your PDA's HotSync and IrDA capabilities would be disabled. Luckily, the latest version automatically resets the Palm's speed to "normal" when HotSync is engaged. Still, according to *Afterburner*'s web site, hang-ups are often caused by overclocking a PDA too far, and this situation must be resolved by resetting the device. This automatically clocks the Palm back to its regular speed and, if a hard reset is necessary, erases all the data living on your Palm. In other words, be sure you've backed up everything before playing with *Afterburner*.

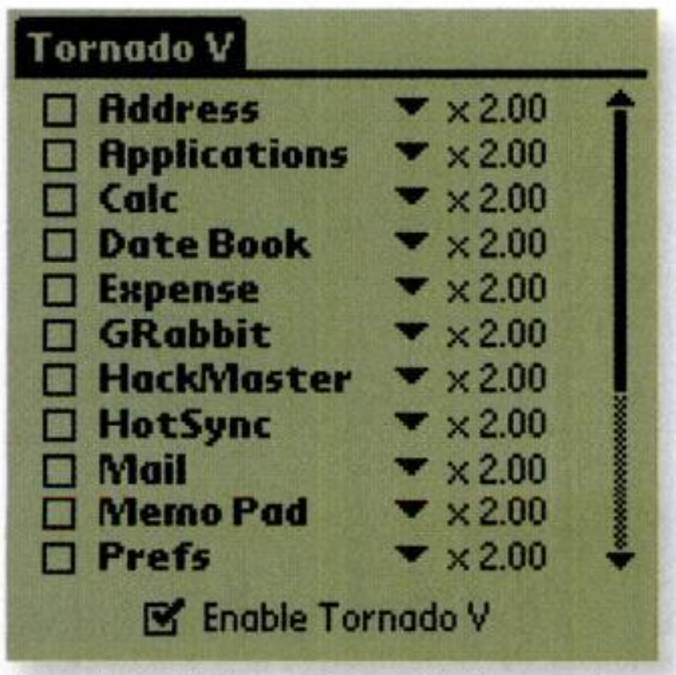
How fast is fast? *Afterburner* can take a Palm V's Dragonball EZ proc from 16MHz up to 29MHz, and some older models, such as the Palm III, up to 21MHz. Go any further, and you should expect to smell smoke.

Afterburner is a *HackMaster* hack that will let you overclock your PDA to oblivion. You can even specify different overclocked speeds for different applications.

Tornado 1.1

www.iscomplete.org/products.htm

Tornado is a slightly more sophisticated application than *Afterburner*, in that it allows you to overclock *and* underclock your Palm. Why would you want to underclock your PDA? Because it reduces power consumption, and reduced power consumption translates into longer battery life. It's just like Intel's SpeedStep technology, except it's for your Palm.

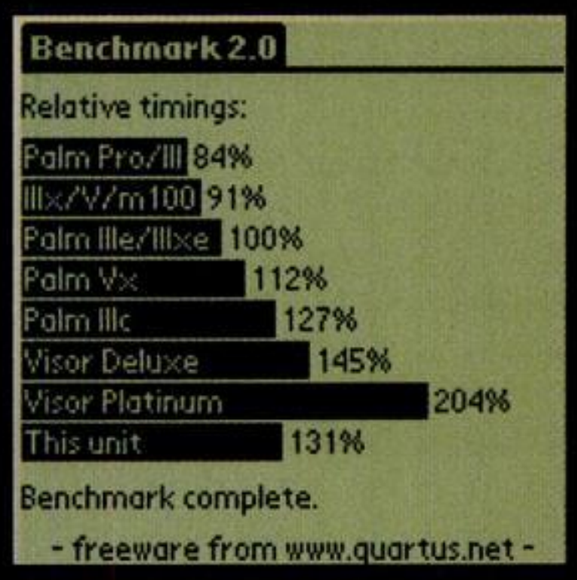


Tornado is a kinder, gentler overclocking app. It won't allow you to overclock your Palm so far that the serial port stops working, so it's probably best for the more casual overclocker.

Like *Afterburner*, *Tornado* allows you to assign higher clock speeds to specific apps via a software interface. But unlike *Afterburner*, the utility imposes a cap on how far you can push your proc—any frequency fast enough to disable communication options isn't allowed. So if you want to futz with overclocking options while avoiding the risk of frying your PDA, this is the overclocking utility for you. But if you're looking to push the envelope, you'll want *Afterburner*'s no-holds-barred overclocking capabilities.

BENCHMARKING

After you've cranked your Palm's CPU as far as it will go, head to **www.quartus.net** and grab the *Benchmark* utility. *Benchmark* calculates a Fibonacci sequence, which stresses a PDA's CPU and memory, and reports scores relative to a stock Palm IIIe. We were able to overclock our Palm V to 39MHz and get a 21 percent performance increase using *Afterburner*.



The *Benchmark* utility will let you measure the performance boost you get from your overclocking experiment, relative to a Palm IIIe. Looks like someone hit 131 percent!

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Hacks-a-Plenty!

While digging around the web, we found a bunch of wacky hacks performed by users who were brave enough to risk destruction of their precious Palms. Here are four of our favorite hack-jobs.

Use Your Palm as a Bicycle Computer

Bikini is a home-grown app that lets you use your Palm as a full-fledged bike computer.

By using a McGuyver-esque hodgepodge of electrical components—including a burglar alarm sensor, a HotSync cradle, and some duct tape—an intrepid hacker created a sensor that let him use his Palm as a bicycle computer.

When pairing the sensor you create with the *Bikini* app, you can use your Palm to chart speeds and distances, then upload the results into a spreadsheet on your PC. Detailed instructions explaining how to create the pedaling sensor are available at **home5.swipnet.se/~w-51358/pilot/** (this URL also has a link to the *Bikini* app).

With some common household electronics, a ball of twine, and some duct tape, you can create your own electronic bicycle sensor that sends data to your Palm.

Add More Memory

When the Palm V was introduced, power users were faced with a difficult choice: Pick the lithe Palm V, which boasts just 2MB of memory, or grab a stocky Palm IIIx, which contains a whopping 4MB?

Tim Charron didn't have to make such a decision. Instead, he figured out how to crack open the Palm V's magnesium case and replace the 2MB chip with a spacious 8MB chip in short order. Although 8MB Palms are now as common as mosquitoes in Mississippi, owners of the original Palm V might want to try this upgrade in lieu of a new PDA purchase. Full instructions for Tim's hack are available at **www.interlog.com/~tcharron/Palm8M/IIIex.html. Caution:** This is one of those hacks that requires chip-yanking and soldering. Proceed with care!

Want to do an organ transplant on your Palm V? This is the chip that you'll need when upgrading a puny 2MB Palm V to a whopping 8MBs.

Power Up Your Palm

Tired of feeding batteries to your power-hungry Palm, even when you're using it at your desk? So was James Garry, so he added a DC socket to his Palm III and created his own power supply to provide the juice.

If you want to juice up your own Palm, take a look at **www.fastlight.demon.co.uk/jg/palm.html** for the full details. Just be aware that even the hack's inventor writes, "You run a very real risk of totally knackering the unit."

If you use your PDA near a handy source of power, such as a power socket, you might want to save batteries by adding a power input to your Palm. Please note, this shouldn't be necessary with newer Palms, such as the V, Vx, m500, and m505, since they have integrated rechargeable batteries.

Create Your Own Robot Buddy

Always wanted your own B.O.B. (you know, the bot voiced by Slim Pickins in *The Black Hole*) to fetch drinks and handle your light welding? Some enterprising PDA aficionados at the Carnegie Mellon Robotics Institute have used a Palm as the heart of their PPRK—or Palm Pilot Resource Kit. The PPRK is a tri-wheeled robot that uses a Palm to control its movements and sense its surroundings.

Want to build your own Palm-powered robot? Check out **www.cs.cmu.edu/~pprk/**. You can either follow the online how-to or purchase a kit for $305. ■

The PPRK uses a Palm III as the brain of this robot. The Palm controls the robot's movement and monitors sensory input from the robot's infrared sensors. The really nifty thing is that you can write your own program to control the robot—if that's the kind of thing that bakes your noodle.

Think our Palm hacks are too wussy for you? Do you use your PDA to control jumbo jets or infiltrate government facilities? Tell us about your PDA hacks and we'll print the best one in an upcoming issue. Send submissions to hackers@maximumpc.com.

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In the Lab

A behind-the-scenes look at Maximum PC testing

A Six-Month Lickin' Reveals...

We proudly introduce our second-look section

If you want a first-hand demonstration of editors in agony, visit the *Maximum PC* offices when we're finalizing product verdicts. We hem. We haw. We wrestle with the differences between head-to-head competitors. Even an innocent suggestion to change a product's verdict from, say, a 6 to a 7 can ignite an hour-long debate over features and performance. Our Verdict-O-Meter ranges from 1 to 10, but the differences between "class-action lawsuit material" (a 1 verdict) and "incontrovertibly Kick Ass" (a 10 verdict) can sometimes be very subtle.

"No static discharge can survive my Lab Coat of Doom!"

And sometimes we miss fine details. So this month, we're introducing a Long-Term Road Testing section to shed light on how products withstand the test of time. If all goes according to plan, the Long-Term Road Testing section should mitigate nagging flaws intrinsic to our evaluation process.

Yes, you read me correctly: Our testing process isn't perfect. True enough, before any product receives a verdict, it undergoes extensive testing in the Maximum PC Lab. But sometimes we uncover product flaws months later, or, on the flip side, we discover cool features that escaped our scrutiny during initial testing. We also revisit products—and sometimes even retest them—after readers pose their own questions about features and performance. Indeed, no matter how exhausting we think it may be, our battery of tests still can't anticipate the thousands of hardware and software configurations of our readers' PCs. Sometimes you discover bugs that we didn't catch, and these too warrant investigation.

It's important to emphasize that products covered in Long-Term Road Testing are not being re-reviewed; verdicts will not be raised or lowered as a result of performance gains or losses. But we're more than happy to report on bug fixes and nifty features we missed the first time around.

And, by the same token, we're more than happy to slam products for glitches we missed during our initial look.

—ROB PRATT, REVIEWS EDITOR

Sound Blaster Upgrade for Audiophiles

What? Testing? Yeah, that's right, we're testing. This is the Maximum PC Lab, and that's what we do in here. Oh, you want to know what we're testing? Hang on a minute while we turn down the music.

Arriving just a bit too late for inclusion in this month's reviews section, Creative Labs' new Sound Blaster Audigy is the first significant upgrade to the Sound Blaster Live! line. For the full lowdown, you'll have to wait a month and read the official review. Until then, check out the specs of the first "high-resolution" PC soundcard that's been designed to meet the needs of gamers and musicians alike. Now, excuse us while we crank up the volume and get back to testing.

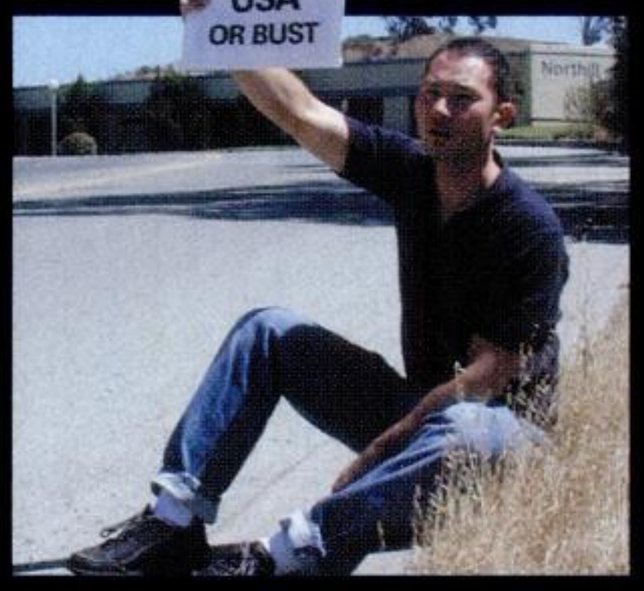
THE SPECS

Analog-to-digital converters	24-bit resolution at 48KHz sampling rate
S/PDIF	Input and output up to 24-bit resolution and 96KHz sampling rate
Effects	Four channels with 32-bit processing
Signal-to-noise ratio	100dB back-panel FireWire connector

Burger and a Side of PCIs

Over the years, the Maximum PC Lab has built up a formidable store of PC hardware. We sometimes take for granted that anything we could possibly need for our day-to-day testing, or even our wildest experiments, will be right at our fingertips. But every now and then, the Lab comes up short.

Logan gleefully went to work building a gaming system as soon as he acquired a new GeForce3 videocard—but something was missing.



Getting the necessary hardware elsewhere proved to be both time-consuming and hugely inconvenient.

Determined to avoid such ordeals in the future, Logan convinced the local roach coach to begin stocking PC delicacies.

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[LONG-TERM ROAD TESTING]

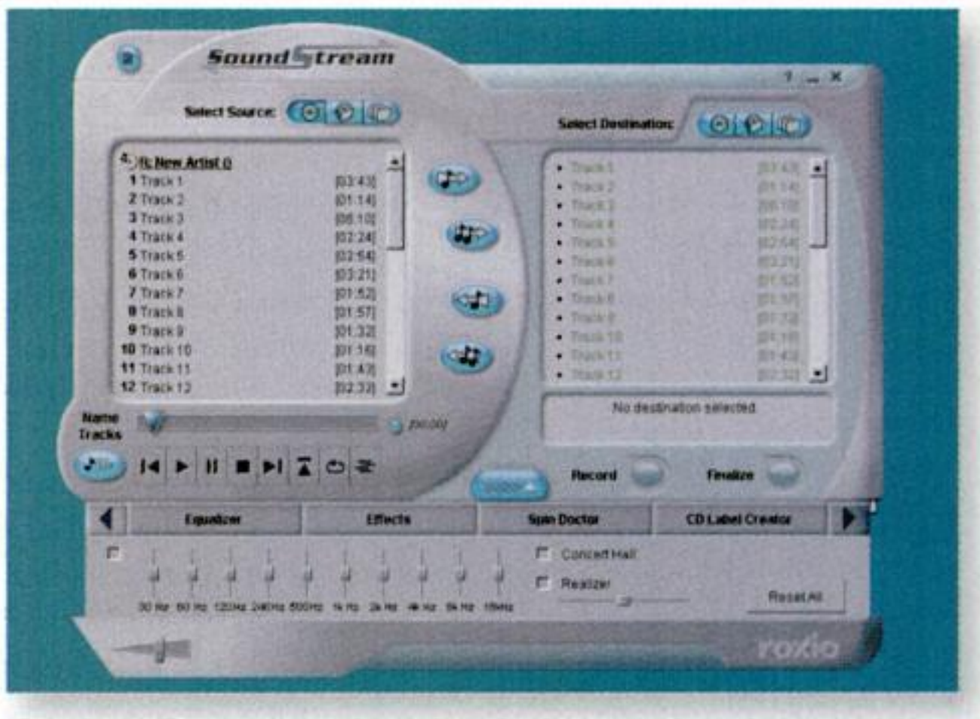
A Second Spin for CD Software

THE PRODUCT: Roxio's *Easy CD Creator 5 Platinum*
Original verdict: 9 (May 2001)

WHAT WE SAID THEN: "More like a care package than a software package, *Easy CD Creator 5 Platinum* includes such surprise goodies as a photo-album organizer, a hard-drive backup feature, a multimedia slide-show creator, and a video postcard designer. Amid these extras, *Easy CD Creator*'s original purpose—to provide a powerful burning engine that's easy to use—remains intact."

FIVE MONTHS LATER: When Tech Editor Will Smith installed a copy of the software on a machine running Windows 2000 Professional, the OS completely locked up during reboot. Will spent the rest of the day desperately trying to recover lost data. We shared the specifics of the problem with Roxio, which identified the glitch as an issue with *Easy CD Creator*'s "Take Two" module, the hard-drive backup utility referenced in our review. A patch available on the Roxio web site fixed the bug, but that didn't end our *ECDC 5* woes. The software also coughed up four coasters when burning discs off our beloved—and Burn Proof-enabled—TDK veloCD 16/10/40. This occurred when trying to make RAW mode disc-to-disc backups (we now wish we had tested this during the initial review).

And what of all those "surprise goodies" mentioned in the original review? After our initial rush of enthusiasm, we found that we never used them.



Cool audio-processing doodads are nice, but we'd rather have an *Easy CD Creator* that provides more control over the CD-burning process.

WHAT WE THINK NOW: We'd gladly trade ease-of-use and a care package of extras for a reliable CD-mastering utility that accommodates our everyday CD-burning needs. *ECDC*'s wizards work great when burning basic audio and data CDs, but they don't deliver the goods when it comes to fine-tuning the CD-burning process. If we were to review this product today, it probably wouldn't receive a verdict higher than an 8.

Intel Shrinks the Pentium III

It's called Tualatin, and it's quietly efficient

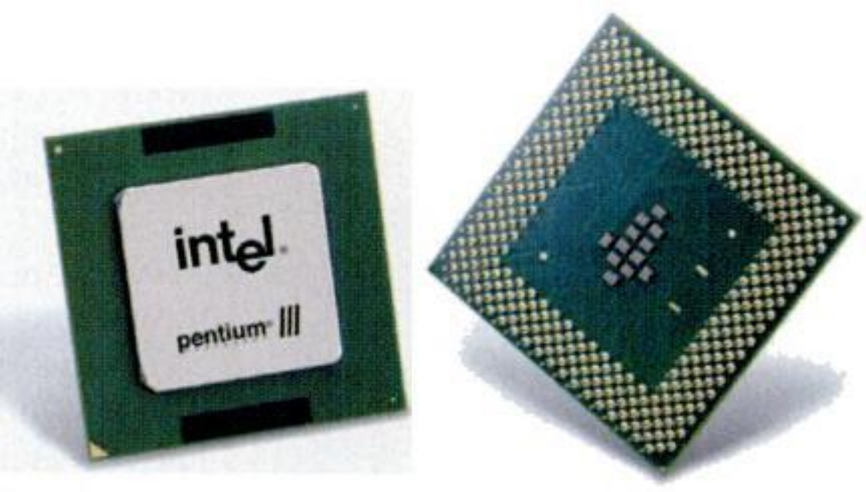
The Pentium 4 may have smashed the 2GHz clock-speed barrier, but that's not the most interesting story coming out of Intel HQ. Amid its campaign to propagate the P4, the granddaddy of all chip manufacturers is also introducing—albeit very quietly—an upgrade to the three-year-old Pentium III.

Built on a 0.13-micron manufacturing process and codenamed "Tualatin," the new P-III's microscopic electronics have shrunk in physical size and power requirements and have increased in overall processing efficiency. Tualatin P-IIIs boast extra-efficient copper interconnects (replacing the old aluminum ones), as well as prefetch functions that can anticipate the data needed by an app, then load the data into cache. These improvements are expected to appear in the next rev of the Pentium 4, which will shift to a 0.13-micron process early next year.

But for now, Tualatin represents the extent of Intel's 0.13-micron CPU family. Notebook versions are called P-III M, server versions P-III S, and desktop versions "P-III on a 0.13-micron process" (though we've seen them described online as "P-III A version"). Please note that the server version includes an additional 256K of L2 cache, and does not cooperate with Intel's 815 chipset, according to Intel.

So, are the P-III's subtle improvements a last hurrah for an aging CPU architecture, a burst of speed down the homestretch? Perhaps. Intel's roadmap indicates that the P-III will be phased out of desktop and server systems by the end of the year, and the new P-III will be relegated to notebooks.

More likely, however, it appears that the new P-III is a harbinger of better things to come—a technological demonstration of what Intel can do with a state-of-the-art process technology. We weren't able to stage a conclusive, apples-to-apples benchmarking battle, but we were able to spend enough time with a Tualatin rig to run a quick round of testing. Our box included a 1.2GHz Tualatin Pentium III A-version, 256MB of PC133 memory, a GeForce3 videocard, and a pair of high-performance hard drives in a RAID 0 array. Our benchmark results are as follows: *SYSmark2001*, 135; *Premiere 6*, 229 sec; *MusicMatch Jukebox*, 298 sec; Maximum PC *Quake III* demo, 53.4fps.



The new Pentium IIIs have smaller electronics and super-efficient copper interconnects.

These *Premiere* and *Jukebox* scores close the gap between the P-III and AMD Athlon performance. To wit, an AMD box running a 1.33GHz Thunderbird Athlon, 256MB of PC2100 DDR memory, a GeForce3, and a similar RAID array was faster by just four seconds in *Premiere* and one second in *Jukebox*. Considering that the AMD box was running much faster memory and a CPU with a slightly faster clock speed, this performance differential actually speaks volumes about the new P-III's capabilities. We're quite confident that this AMD rig would have tossed around the old P-III like a rag doll. ■

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Hypersonic CycloneLAN

This storm-in-a-box thunders through gaming benchmarks

The side-panel cutout lets loose a light show. In gaming, the record-setting performance of this LAN party-oriented system is just as flashy.

Hypersonic's CycloneLAN gaming system hit the Maximum PC Lab like a category 5 hurricane. It belched flashes of light upon boot-up and blew away all other gaming systems during benchmarking, shattering records in 3D gaming performance.

The rig's aluminum mini-tower features an acrylic window through which you can view the CycloneLAN's dazzling interior light show. One light emits a violet glow, while another spits out an orange flicker in time with the booms and rumbles of games. But this rig is about more than just flash. Armed with a 1.7GHz Pentium 4 and VisionTek GeForce3, the CycloneLAN posted an incredible 61.1fps in our home-grown *Quake III* demo and an even more astounding 18.6fps in *3DMark2001*'s Game 4 demo.

If you're not impressed by the Game 4 frame rate, you need to consider the big benchmarking picture: Because it essentially tests just DirectX 8.0 functionality and only draws on a videocard's graphics processing unit, Game 4 pretty much yields the same frame rates in all systems equipped with a GeForce3 card; benchmark scores rarely vary by more than tenths of a frame. In this respect, the Game 4 demo isn't at all like, say, our *Quake III* test, which yields faster frame rates on systems equipped with faster processors. Enter the CycloneLAN, which in Game 4 beat the next highest OEM gaming rig score by a total of 2.4fps!

We credit the record-setting performance to Hypersonic's overclocking shenanigans. The zany rebels in Hypersonic's engineering corps pushed the videocard's core clock frequency to 215MHz (from a default of 200MHz) and upped the memory clock frequency to 257.5MHz (from a default of 230MHz). Worried about buying such a supercharged chunk o' silicon? Well, we ran the full suite of tests and demos in *3DMark2001* at maximum resolution to test the stability of the overclocked videocard and found they would run in looping mode for no more than four hours. This belies the notion of foolproof stability, but it does suggest that the system can handle most gaming marathons.

In the *SYSmark2001* Windows' apps suite, the CycloneLAN scored a 146. That's not the best we've seen from a 1.7GHz P4 system, but it's slightly ahead of average. The CycloneLAN's score of 240 seconds in our *Premiere 6.0* video-rendering test beat the best P4 score, but significantly trailed scores recorded by Athlon-based systems. In our *MusicMatch Jukebox* MP3-encoding test, the CycloneLAN hit 240 seconds, beating the previous record time by two seconds.

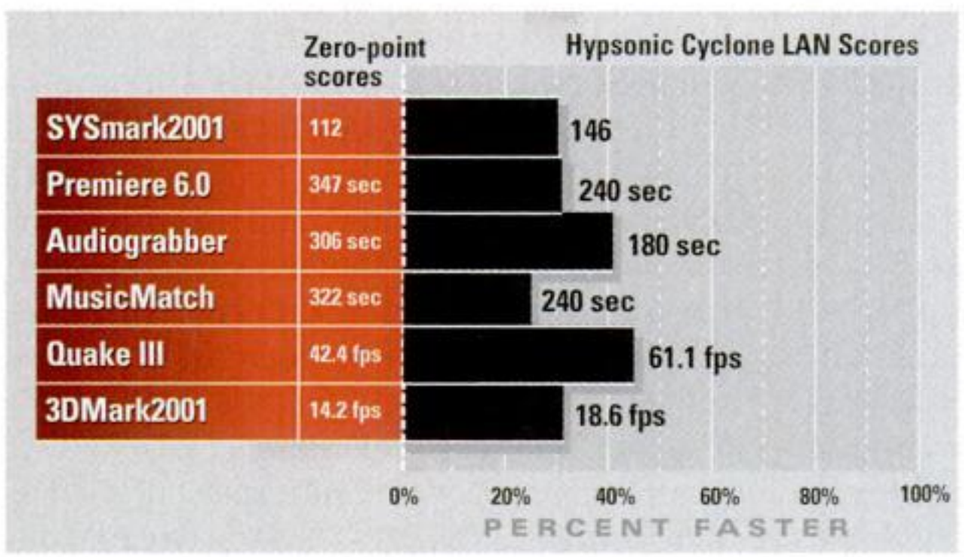
The Plextor 16/10/40A CD-R/RW burner turned in great marks for ripping audio, but like many drives that write at 16x or faster, it had trouble reading data from the last two tracks of our 72-minute test CD. We've noted the problem on several other high-speed burners (see story, page 23), so we can't fault Hypersonic's configuration. But we can gripe that Hypersonic didn't include at least another CD-ROM drive or, better yet, a DVD-ROM drive.

We're concerned about the stability of the CycloneLAN's overclocked videocard, but we love the performance. (FYI: Hypersonic warrantees their overclocked videocards.) With nifty extras like GearGrip carrying harnesses, a MidiLand headset, and an upgrade option that offers a suite of preloaded and preconfigured LAN games, the CycloneLAN is exactly the kind of system we'd take to a wild frag happening.

—ROB PRATT

UNDER THE HOOD

THE BRAINS	
CPU	Intel Pentium 4 1.7GHz
Motherboard	Asus P4T
RAM	256MB PC800 RDRAM
I/O ports	Two USB, two serial, one parallel, PS/2 keyboard and mouse
Open slots	2 PCI
NETWORKING	
LAN	3Com 3C905 10/100 Ethernet PCI card
Modem	N/A
DISPLAY	
Videocard	VisionTek GeForce3 64MB DDR
Monitor	NEC FE-700+
Refresh@ max res	66Hz@1280x1024
STORAGE	
Hard drives	2 IBM 20GB Deskstars, 7200 rpm
RAID	Highpoint ATA/100
DVD-ROM	N/A
CD-RW	Plextor 16/10/40A CD-R/RW
SOUND	
Soundcard	Creative Labs Sound Blaster Live! X-Gamer
Speakers	Klipsch ProMedia 2.1
EXTRAS	
APC SurgeArrest Personal, GearGrip Pro system carrying harness, GearGrip CRT carrying harness, MidiLand HM-7602C headset	
BUNDLE	
Windows ME, *Easy CD Creator 4.0, Team Sound*	
BOOT: 54 sec	**DOWN: 2 sec**



Full benchmarking details at www.maximumpc.com in Mag Reprints

MAXIMUMPC VERDICT

CycloneLAN
HYPERSONIC

+ WHAT WE LIKE

Ooo! Pretty lights! And the performance is just as flashy.

– WHAT WE HATE

The overclocked videocard has some stability issues. There's no DVD-ROM drive. And if you're going to bundle a 17-inch display for a LAN-party box, it better be a good one.

800.520.0498 www.hypersonic-pc.com
$2,887

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Gamewarrior Mojo PC V1.3

Incredible Athlon performance, but it needs some interior redecorating

Smooth slotting: The Pioneer DVD-ROM's automatic feed had us recalling the ease of a car's CD player.

It's sleek on the outside, but like a Tootsie Roll pop, it becomes unattractive towards the center.

Gamewarrior is not, as you might surmise, the alter ego of a *Tribes 2* fanboy who spends his weekends assaulting strangers with a Sidewinder gamepad. It's a tiny PC vendor that does all of its business online and turns out quite a spiffy gaming rig. Propelled by a trusty Abit KT7A-RAID motherboard, a 1.3GHz Athlon, and a VisionTek GeForce3 videocard, the Mojo Gamewarrior system performed like it was ready to stand up to the best gaming machines around.

Sporting two 40GB IBM Deskstars connected in a RAID 0 configuration, a speedy Pioneer 16x DVD-ROM with an elegant slot-feed, and a Plextor 16/10/40A CD-R/RW burner that turned in the fastest audio extraction performance anyone could expect from a 16x drive, the Mojo is a surprisingly solid machine—particularly in comparison to other 1.3GHz Athlon machines we've tested in the past.

We were considerably surprised by a *Quake III* frame rate of 52.4fps. Despite the fact that the Mojo is fueled by a mere 256MB of PC133 SDRAM and that neither the CPU nor the videocard was overclocked, the machine handed in the best *Quake III* score we've recorded for an Athlon system. Almost as if to emphasize the flexibility of its talents, the Mojo Gamewarrior was also speedy in our *Premiere* video-rendering test. It crunched through our rigorous footage in 232 seconds—several seconds faster than the best 1.7GHz Pentium 4 systems.

The Altec Lansing ACS-54W 4.1-surround PC speakers included with the rig offered solid directional arcs in *Unreal Tournament*, *Quake III*, and Dolby Digital 5.1 DVD playback. Unfortunately, the subwoofer's low rumbles didn't come across with the authority we demand. As far as we're concerned, it's a cardinal sin for any gaming machine to deny us our God-given right to experience gunfire in all its rumbling glory.

The rig's hardware bundle includes a Sidewinder Force Feedback 2 joystick, but no great games to put it to use. In fact, the only games pre-loaded on the Mojo are the ones included with the Sound Blaster Live!'s now-dated X-Gamer bundle. Phallically challenged gamers might get a rise out of mounting the Sidewinder on their desks, but given the game bundle's emphasis on first-person shooters, we found the bulky joystick useless. So we reached instead for the rig's trusty Logitech mouse.

We also have reservations about the split-loom tubing that litters the inside of the Mojo case. We love the stuff for tidying up wires. In fact, we decked out all of our Dream Machines with the material. But instead of collecting wire-runs together into a couple of tubes, Gamewarrior gives each individual cable its own split-loom sheath, and the end result is an unsightly tangle of tubes.

If Gamewarrior had imbued the Mojo with more power, and had taken more care with its insides, this system might have Fred Astaired its way into Kick Ass territory. But instead it gets a 7. It uses SDRAM instead of DDR and is significantly slower than the Hypersonic on page 62, which includes a monitor and costs just about $90 more. As it stands, the Mojo is an admirable (and pricey) machine from a fledgling company, and Gamewarrior has some rethinking to do before it can join the privileged heavens of the gaming titans.

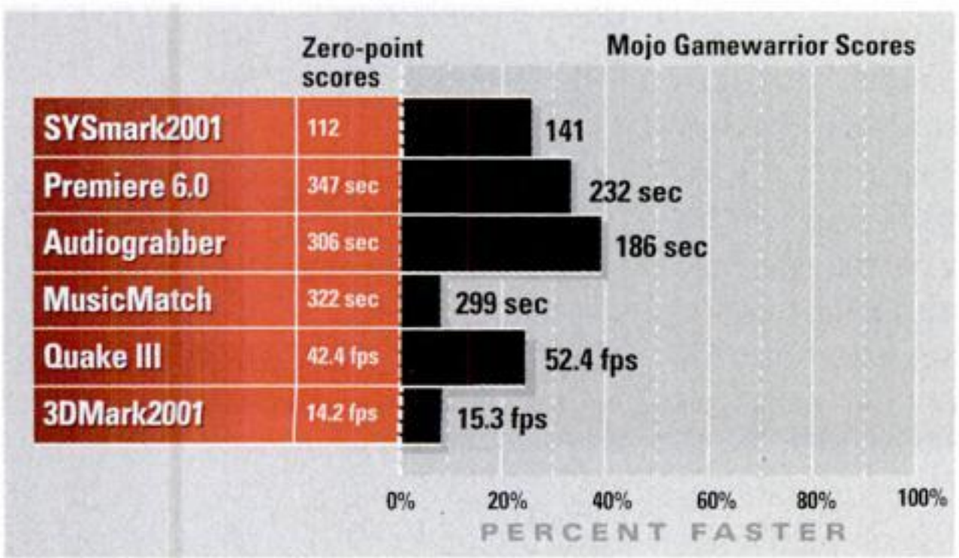
—EDWARD CHAMPION

UNDER THE HOOD

THE BRAINS	
CPU	AMD Athlon 1.3GHz
Motherboard	Abit KT7A-RAID
RAM	One 256MB PC133 SDRAM DIMM
I/O ports	Four USB ports, two serial, one parallel, PS/2 keyboard and mouse
Open slots	4 PCI, 1 ISA
NETWORKING	
LAN	3Com 3C905 10/100 NIC
Modem	N/A
DISPLAY	
Videocard	VisionTek GeForce3 64MB DDR RAM
Monitor	monitor not available
STORAGE	
Hard drives	Two 40GB IBM Deskstars, 7200rpm
DVD-ROM	16x Pioneer DVD-ROM
CD-RW	Plextor 16/10/40 PlexWriter
SOUND	
Soundcard	Creative Labs Sound Blaster Live! X-Gamer 5.1
Speakers	Altec Lansing ACS-54W 4.1 System
BUNDLE	

Windows ME, *Deus Ex*, *MDK2*, *Unreal Tournament*, *Thief II*

BOOT: 39 sec | DOWN: 7 sec



Full benchmarking details at www.maximumpc.com in Mag Reprints

MAXIMUM PC VERDICT

Mojo V1.3

GAMEWARRIOR PCS

WHAT WE LIKE

We've never seen such impressive benchmark results from an Athlon-based system using PC133 memory.

WHAT WE HATE

Where's the bass? It's certainly not in this system's PC speakers.

716.586.6553 www.gamewarriorpcs.com

$2,795

7

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Kyocera Finecam S3

A convenient camera for the road, but light on image quality

It's smaller than Canon's Digital Elph, and with 3.34-megapixel resolution, it has a million more pixels. Though the looks and specs roused our gadget-lust, inconsistent image quality proved a real turn-off.

The Kyocera Finecam S3 is a beautiful, stylish, and alluring nymph of a camera. It's even a tad smaller than Canon's PowerShot S100, but clocks in with a 3.34-megapixel CCD, which bests the Canon's relatively puny 2.11-megapixel output. The S3 is so well-designed and solidly built that it'll make your gadget-hungry friends jealous, and it might even get you dates. All of this made us terribly eager to get our hands on this gem—and equally disappointed when we discovered that the S3's image quality falls short of our expectations of a 3-megapixel camera.

Some of our test photos exhibited "fringing"—in other words, color aberrations around the outlines of objects with bright backgrounds. We also detected instances in which colors bled into neighboring pixels. These problems are a result of "blooming," which occurs when a photosite on the camera's CCD receives more charge than it can handle and spills charge over to surrounding pixels. While blooming is a problem common to digital cameras, it occurred more frequently and was more pronounced in the Finecam's output than with other comparably priced cameras.

SPECS	
Lens	f/2.8–3.5, 2x optical zoom (38–76mm, 35mm equivalent); 2x digital zoom
Storage	MultiMediaCard or SD Memory Card (16MB MMC included)
PC connection	USB card reader and cable included
Image formats	Uncompressed TIFF, JPEG, AVI

High-contrast lighting situations caused other problems. When using the evaluated metering mode in bright sunlight, our shots suffered blown-out image highlights with little or no detail. Colorful subject matter, while appearing saturated and natural when shot in open shade, looked artificially saturated when shot in bright sunlight and sometimes developed a yellow cast. Image quality proved more respectable in other conditions, but we expect more consistently pleasing results from a $700 camera.

Image detail wasn't great either, as we found the definition to be low for a 3-megapixel camera. Many of our test images appeared soft as well, despite the auto-focus having provided the green confirmation light while we were shooting. In-camera sharpening is apparently set fairly low in this camera, though this might contribute to the Finecam's impressively-minimal image noise in the output.

The Finecam employs a couple of unusual components that facilitate its tiny formfactor. For one, it ships with a postage stamp-size 16MB MultiMedia Card and is compatible with SD memory cards. Since the Finecam S3 doesn't have a data connector for transferring images to your PC, the removable media support is essential. In a stroke of genius, Kyocera also bundles a USB-based card reader with the camera. To get images into your PC, just remove the MMC, slide it into the card reader, and drag and drop images in Windows. The S3's other slim-and-thin feature is a 3.6V lithium ion battery pack that can be recharged in-camera. We like the battery pack's small size and light weight, but not its five-hour recharge time. An extra battery pack provides a backup option, but that'll cost you $75.

An excellent traveling companion, the S3 is a camera that's pocket-size even if you're not wearing cargo pants. Responsive and well-laid-out controls make it easy to operate, and you get some manual adjustability with two aperture settings, three long exposure modes, and a manual focus. Other features include a 2x optical zoom and a movie mode.

The Finecam S3 is certainly a stylish and well-built gadget. But there are a lot of other cameras—namely, Nikon's Coolpix 880, Kodak's DC4800, and Olympus' C-3000—that deliver significantly better-looking pictures for the money. Ultimately, image quality should be the highest priority for a camera at the upper limit of the mid-level price range.

—MICHAEL SHAPIRO

MAXIMUMPC VERDICT

Finecam S3
KYOCERA

WHAT WE LIKE

The Finecam S3 packs 3-megapixels into a sturdy case that'll fit into your pocket even if you're not wearing cargo pants.

WHAT WE HATE

For this resolution—and this $700 price—the image quality is unacceptably inconsistent.

800.526.0266 www.yashica.com
$700

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DDR SDRAM

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K7V 龍 DRAGON

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Yamaha CA/VIT RP-U200

The future of PC audio? Not if you want to play games

Yamaha's new "PC audio platform," the CA/VIT, looks like a VCR tilted up on its side, but it's really more like a home theater receiver for your PC.

Yamaha says that CA/VIT, its new "PC audio platform," looks to the future of computer audio, and indeed, the mini-monolith's brushed-aluminum exterior certainly has a futuristic look. But beyond the slick aesthetics, CA/VIT's future looks cloudy. Poor gaming performance makes us question whether it really represents the "convergence of audio/video and information technologies," as its acronym so proudly declares.

About the size and shape of a VCR tilted up on its side, CA/VIT is basically a pint-size home theater receiver that you can control from your PC. On the front panel are four buttons that let you toggle among input sources (PC, Aux 1, Aux 2, and FM tuner). A 2-inch-square LED shows active input, speaker mode, and DSP settings, and a big dial at the bottom of the front panel adjusts volume. If you have an audio signal coming from your PC, home stereo, or DVD player, then the CA/VIT's back panel has a home for the hook-up. Connectors for USB, coax S/PDIF, optical, and analog RCA plugs are all present and accounted for.

Unlike a soundcard, you don't have to bust open your PC case to install the CA/VIT. Just connect your home stereo speakers to the bare wire spring-locks, connect the CA/VIT to your PC with a USB cable, plug in the power cable, and turn it on. Our Windows 2000 and Windows ME test systems instantly recognized the CA/VIT and installed a generic USB audio driver.

If you want to watch DVD video (be it from your PC or set-top DVD player) in full Dolby Digital 5.1 sound, you'll have to spend an extra minute to install a driver. The unit's software bundle includes a configuration utility that helps you control the CA/VIT from your PC; you can use it to toggle among a number of stereo and surround-sound speaker presets, adjust EQ, and apply a number of reverb effects. You can even use it to adjust the text that displays on the CA/VIT's LCD screen. Like most PC audio hardware, CA/VIT has lame EQ and DSP effect presets, but the configuration app does have useful features. The graphical Dolby Digital mixer controls left-to-right, front-to-back, center, and subwoofer balance and includes a pair of delay settings to optimize speaker configuration for home theater systems.

As far as overall audio quality goes, CA/VIT truly excels. It pumped music and DVD playback through our Dolby Digital 5.1 speakers with razor-sharp stereo and 3D audio imaging. Its dynamic range accommodated everything from soothing classical music passages to bombastic dance music tracks. And the CA/VIT is the first consumer-level PC audio device we've seen that supports 24-bit audio and up to 96KHz sampling rates for both playback and recording. That's a big step up from the CD standard of 16-bit audio at a 44.1KHz sampling rate.

We were initially skeptical about using a USB audio interface to stream six channels of bandwidth-intensive digital sound, but the CA/VIT's flawless DVD audio playback won us over. During testing, we monitored USB bandwidth with the Device Manager utility provided in Windows 2000. Even with the heavy bandwidth load of a Dolby Digital 5.1 audio stream, the CA/VIT demanded less than 25 percent of the available USB bandwidth on our test system.

After a fantastic performance in our home theater testing, the CA/VIT sorely disappointed us in gaming tests. Since it's more like a home stereo receiver than a soundcard, CA/VIT doesn't support the two most common positional audio formats used in gaming, EAX and Direct Sound 3D. This left us in stereo-only mode for *Unreal Tournament* matches, *Counter-Strike* assaults, and *Max Payne* firefights. Boo-hoo. Seriously, this sucks. For hardcore gaming rigs, we'll take the Hercules Game Theater XP over a CA/VIT. But for a PC-based home theater, the CA/VIT RP-U200 far exceeds any Dolby Digital 5.1-capable soundcard we've tested in versatility, DVD audio power, and punch.

—ROB PRATT

MAXIMUM PC VERDICT

CA/VIT RP-U200
YAMAHA

+ WHAT WE LIKE

The back-panel connectors accommodate all of your home stereo and home theater gear, and the audio quality is first-rate.

– WHAT WE HATE

Since it doesn't support 3D audio formats, you only get stereo audio in games.

888.435.7932 www.yamaha.com

$450

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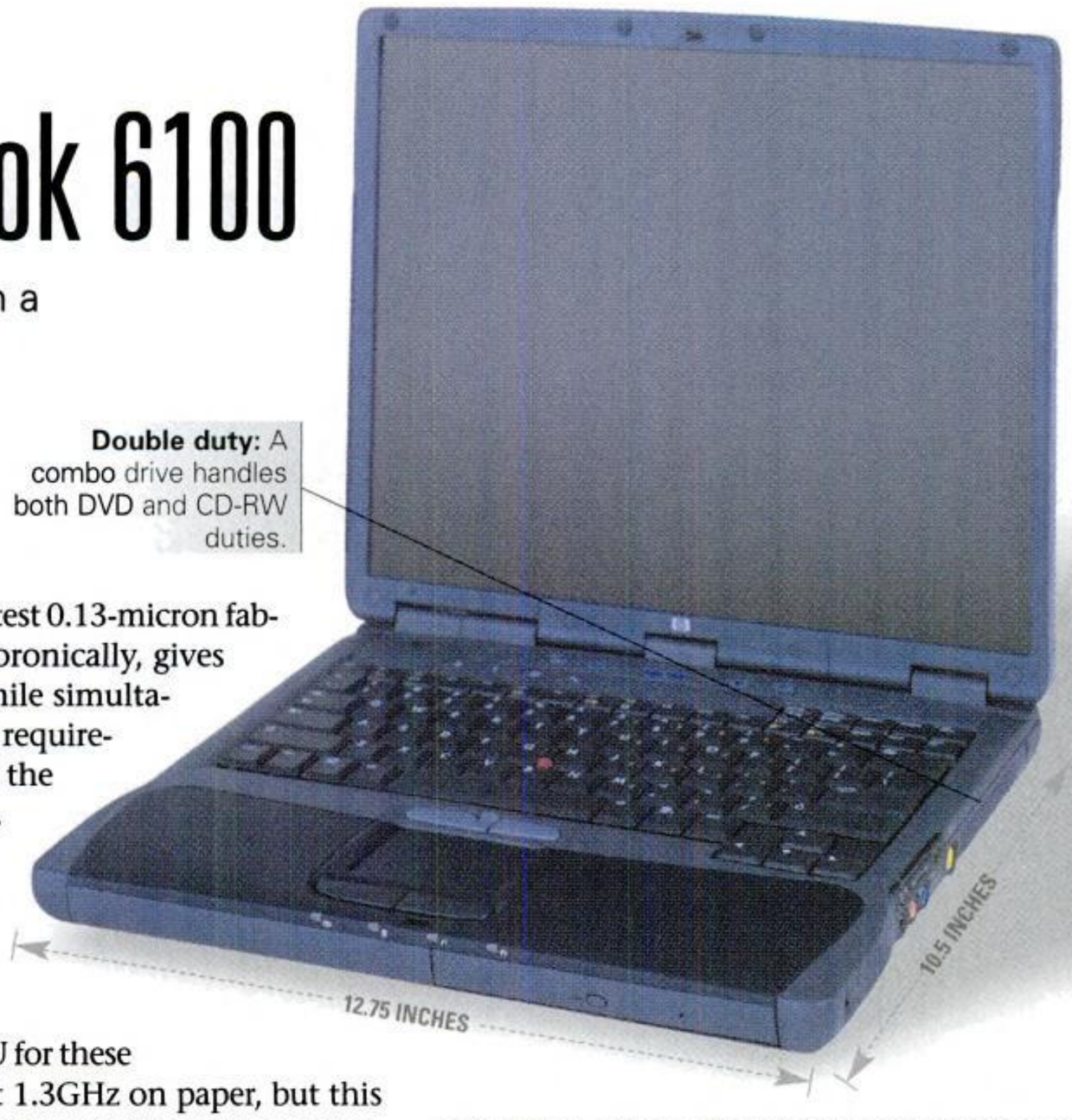
HP Omnibook 6100

A desktop replacement in a teeny-tiny package

Packing Intel's killer new P-III-M and ATI's mobile Radeon, the Omnibook 6100 not only lumps up the bigger notebooks, it also beats down many desktop machines.



Double duty: A combo drive handles both DVD and CD-RW duties.

The highlight of Hewlett-Packard's Omnibook 6100 is Intel's new Pentium III-M processor. The "M" denotes the implementation of Intel's latest 0.13-micron fabrication process, which, oxymoronically, gives you more processing power while simultaneously reducing overall power requirements. In the Omnibook 6100, the P-III-M lives up to its promise. The 6100 shattered almost all of our previous mobile speed records and shamed even our 1.3GHz Pentium 4 desktop zero-point systems.

You can directly credit the CPU for these performance gains; it might hit 1.3GHz on paper, but this rather pedestrian frequency is augmented by nifty new features. The P-III-M features more L2 cache than a regular P-III (512K up from 256K) and is paired with the new 830M chipset, which increases a notebook's frontside bus speed from 100MHz to 133MHz. HP configured our Omnibook with 256MB of PC133 memory and left a second SO-DIMM slot open for future upgrades. The 830M chipset itself supports up to 1GB of RAM.

In last month's issue, we knocked HP's Pavilion n5400 notebook for pairing a 1GHz Athlon with a lame-o graphics chipset that relies on system memory for texture storage. The result? Piss-poor frame rates. Fortunately, the Omnibook 6100 doesn't repeat this faux pas. Instead, it comes with ATI's new Mobility Radeon, which boasts 16MB of discrete SDRAM and doesn't disappoint.

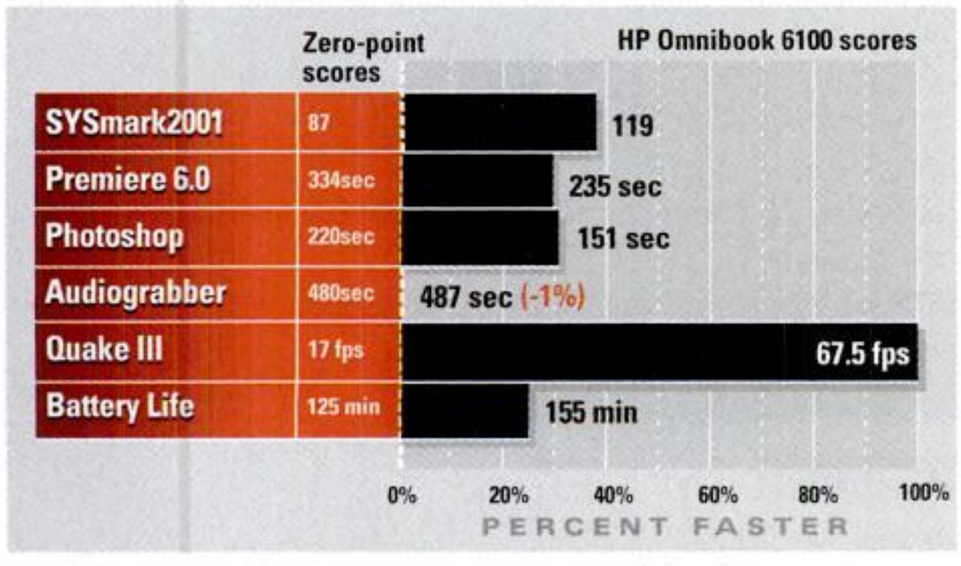
Between the P-III-M and the Mobility Radeon, HP has cobbled together one hot rod of a notebook. In our *SYSmark2001* benchmark, the P-III-M gave us a record notebook score of 119. That's not only faster than the 1GHz Dell Inspiron i8000 and HP Pavilion n5400 notebooks we recently reviewed, but it's also a hair faster than our P4 desktop test systems. Doh! Though the Omnibook doesn't have a FireWire interface, it could certainly render some DV projects if it was ever called upon to do so. In our *Premiere* video-rendering benchmark, the notebook scored a phenomenal 235 seconds. That's faster than some of the 1.7GHz P4 and 1.4GHz Athlon systems we've seen of late. The Omnibook did just as well in our *Photoshop* test, but the notebook's scores came back to earth in our audio extraction tests, where the Omnibook slightly trailed our Micron Transport zero-point notebook by a few seconds. You can blame the Omnibook's sluggish Panasonic combo DVD-ROM/CD-RW drive. Regardless, the Omnibook did an excellent job in our *Quake III Arena* benchmark, scoring a very solid 67.5fps at 800x600. At 1024x768, the frame rates dropped to a very playable 42.3fps. And, true to Intel's claims, the P-III-M does seem to consume less power. The Omnibook took our DVD movie battery test to a full 155 minutes—that's about a 24 percent improvement over our zero-point notebook.

MAXIMUM PC KICK ASS PRODUCT

The magnesium-shelled notebook's amenities are top-notch. HP has left both PC Card slots open by running an ActionTec 802.11b LAN card in the mini-PCI slot. Even cooler, an external switch lets you easily turn the wireless networking on and off. You have a choice of using either an eraser-nub controller or Glide pad, and we found the placement of the controls to be friendly toward fast touch-typists.

There's not much to complain about in the Omnibook besides the price—it's a tad expensive at $4,300. It also doesn't feature the 1600x1200 resolution of the Dell Inspiron i8000 we tested in June, and it doesn't have FireWire support. We were also unable to operate the dual-head monitor support under Windows 2000. Finally, for a so-called thin-and-light notebook, it's neither very thin nor very light. But then again, the Omnibook's performance shames desktop replacements—and even a few desktop systems.

—GORDON MAH UNG



Full benchmarking details at www.maximumpc.com in Reprints

UNDER THE HOOD

THE BRAINS	
CPU	1.13GHz Pentium III-M (SpeedStep 733MHz)
Chipset	Intel 830M with ICH3M
RAM	256MB PC133
I/O ports	Fast Ethernet, V.90, PS/2, 2 USB, S-video out, parallel, serial, VGA, IrDA, headphone, mic, audio out, docking port
NETWORKING	
LAN	Intel Pro/100 VM Actiontec PRISM Wireless 802.11 PCI Card
Modem	3Com V.90 mini-PCI 556B
DISPLAY	
Videochip	ATI Mobility Radeon M6-P 16MB DDR
Display	15.1-inch XGA
Max res	1400x1050
STORAGE	
Hard drive	30GB Toshiba MK3017GAP 4,200 RPM
Optical	6x/4x/4x/24x DVD/CD-RW Matshita UJDA710
Removable	3.5-inch floppy
SOUND	
Audio chip	ESS Allegro ES1988
WEIGHT	
Lap weight	6.5 lbs.
Carry weight	7 lbs.
BUNDLE	
Windows 2000 Professional, *Easy CD Creator 4*, InterVideo *WinDVD 2000*	
BOOT: 64 sec	**DOWN: 8 sec**

MAXIMUM PC VERDICT

Omnibook 6100
HEWLETT-PACKARD

WHAT WE LIKE

Intel Pentium III-M offers speed and power economy, and a built-in WiFi wireless LAN card lets us access our network in seconds.

WHAT WE HATE

The lack of dual-head support in Windows 2000 and a painful price marred an otherwise exceptional notebook experience.

800.752.0900 www.hp.com
$4,300 w/DVD combo

9

Klipsch ProMedia 5.1

Loud enough to liquefy organs, pure like the driven snow

The ProMedia 5.1's deliver awesome punch and bass that rivals home theater subwoofers.

Like earlier Klipsch products, the ProMedia 5.1s represent the pinnacle of PC audio. When teamed with the right soundcard, they can turn your PC into a DVD home theater system nonpareil. The kit comes with five identical satellites (the one that performs center-channel duties comes with a monitor-mounting stand) and a massive subwoofer armed for subsonic warfare. In contrast to the satellites found in Klipsch's 2.1 and 4.1 PC offerings, the 5.1 satellites have metal tweeters and inverted dustcaps on the midrange drivers. Klipsch also switched the wiring connectors on the satellites from headphone-style jacks to dual spring-clip wire terminals.

The subwoofer is an entirely new animal. The dual 6.5-inch drivers found in the ProMedia 2.1 and 4.1 systems have been replaced with dual 8-inch drivers; the resulting bass rivals that produced by many high-quality home theater systems. Also new to the Klipsch mix is the Control Tower, which includes independent digital controls for volume, center, rear, and subwoofer levels. The Control Tower sports a digital volume readout that comes in handy if you want to prevent unpleasant, ear-bleeding surprises. The Tower also offers an additional stereo input, as well as a headphone jack that features an independent volume control. The end result is the crispest sound we've ever heard, even at maximum volume.

We have just a single consumer caveat—the 5.1s don't come with a digital decoder box, so if you want to play ball, you'll need a 5.1-capable analog soundcard. We teamed the 5.1s with the Sound Blaster Live! 5.1. Setup was a snap, sound quality was flawless, and we were convinced the ProMedia 5.1s are the best PC speakers in their category.

WHAT WE LIKE: Crisp, clean sound reproduction, fantastic bass punch, and kick-ass extras such as the Control Tower.

WHAT WE HATE: There's really nothing to hate. The ProMedia's don't include a Dolby Digital decoder box, but one is available from Klipsch's web site for $100. We recommend buying a good 5.1 soundcard instead.

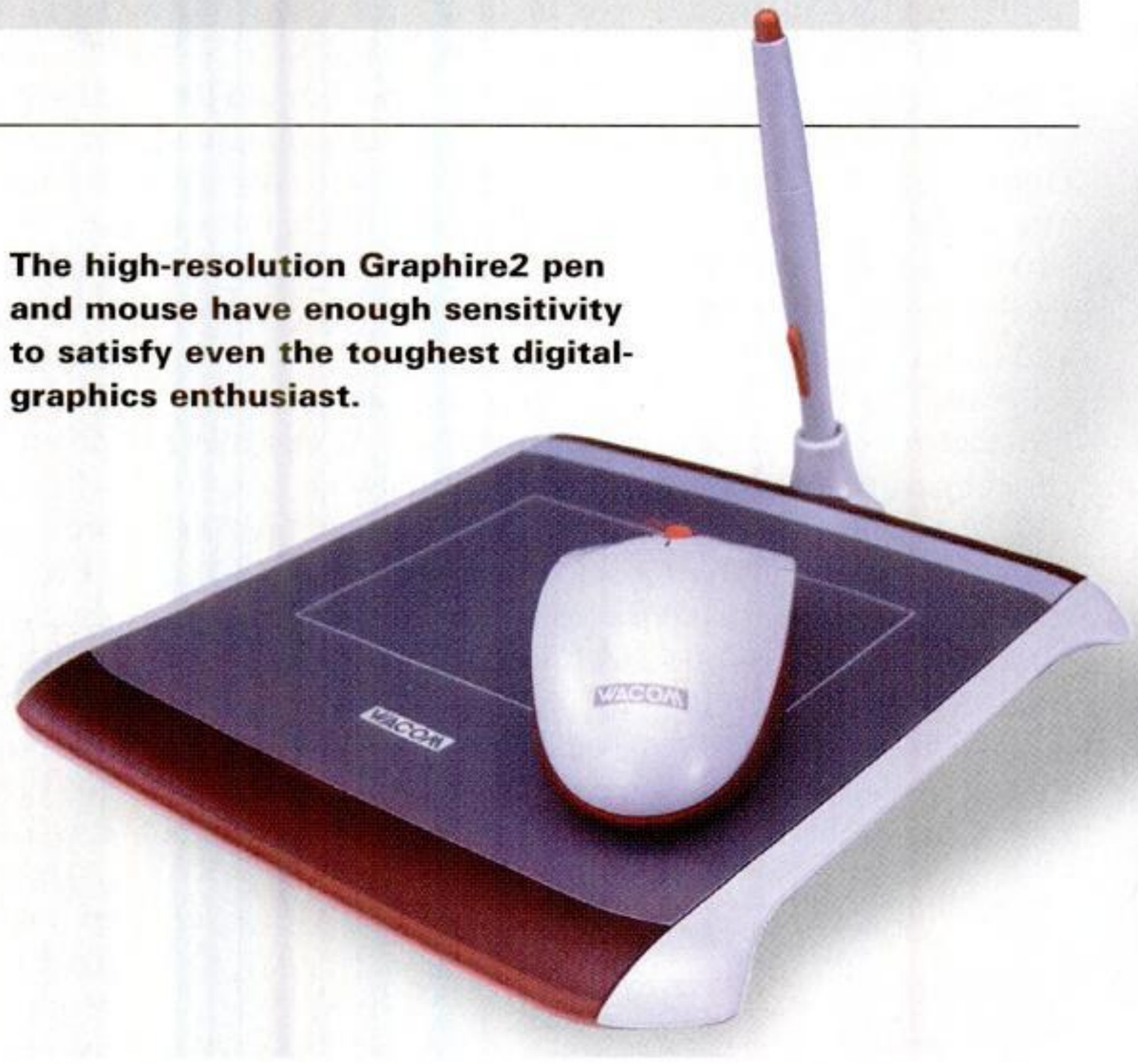
—WILL SMITH

MAXIMUM PC VERDICT: 10

$400, Klipsch, www.klipsch.com, 800.544.1482

Wacom Graphire2

Minor upgrades to an already great tablet kit



The high-resolution Graphire2 pen and mouse have enough sensitivity to satisfy even the toughest digital-graphics enthusiast.

For most *Photoshop* tasks, editing images with a mouse is fine and dandy. But for precision work—such as creating form-fitting selection areas and hand-retouching the heartbreak of psoriasis on a beloved uncle's digital portrait—only a graphics tablet will do. Enter Wacom's Graphire2, which makes a pair of minor upgrades to the original Graphire line. The end result is a 4x5-inch, USB-based tablet—complete with a pressure-sensitive pen and cordless mouse—that can turn your PC into a digital sketchpad.

The Graphire2's pen features 512 levels of pressure sensitivity, which is enough to make even the toughest graphics enthusiast weep with emotion, and double the sensitivity of other graphics pens we've tested. The mouse reads 1,015 lines per inch—double that of most standard optical mice. All that resolution means that brushstrokes in graphics applications look a lot more natural and selection areas are a lot less prone to jaggy curves. Neither the pen nor the mouse has been upgraded since the original Graphire kit came out, however. The version upgrade merely introduces some cosmetic changes to the tablet itself and revamps the mouse driver, adding more precise control over acceleration and speed.

As a product upgrade, the Graphire2 is hardly worth it. Even the bundled software, Adobe's *Photoshop 5.0 LE* and Corel *Painter Classic*, are holdovers from the first-generation Graphire. But for graphics and digital-imaging enthusiasts who don't already have a tablet, the Graphire2 adds even more precise mouse control to the best graphics tablet available.

WHAT WE LIKE: For graphics enthusiasts, the high-resolution cordless pen and mouse have more than twice the sensitivity of an optical mouse—and no batteries are required.

WHAT WE HATE: It's a pity to use such great graphics tools with software that's so dated.

—ROB PRATT

MAXIMUM PC VERDICT: 7

$100, Wacom, www.wacom.com, 800.922.6613

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TDK veloCD 24/10/40

The feel-good drive of the year—with a surprise-twist ending!

Enough with the iMac wisecracks already! The veloCD 24x combines foxy design with actual performance.

One can only imagine the heartbreak a gymnast feels after pulling off a series of amazing maneuvers only to stumble on the landing. That's how we felt when the TDK veloCD 24x finished our gauntlet of Lab tests. The burner practically rubbed elbows with perfection, but then lost its footing on a couple of nagging bugs that ultimately robbed it of a Perfect 10 verdict.

For the last few months, we've been warning you that optical drives would soon hit a write-speed ceiling. The latest veloCD doesn't just hit the ceiling—it slams into it full-on. So, in order to achieve super-collider velocities of 24x, the drive uses a technology called Zone-CLV, which divides the surface of a disc into three discrete speed zones. Think "school crossing," "freeway," and "Autobahn." Zone-CLV only reaches its full 24x performance rating at the outer edges of a disc, but you shouldn't feel betrayed by this ostensible shortcoming. The latest veloCD still turns in, as expected, the fastest burn rates we've ever seen.

With a 23.96x average transfer rate across the span of the disc, we burned a 647MB data CD in 4:06 minutes—and thus another Lab record bit the dust. CD-RW burn times were just as impressive. The drive required just 14:63 minutes to format a CD-RW and just 7:09 minutes to burn the packet-writing-formatted disc. The veloCD's random and full-stroke access times came in well below the competition at 102ms and 183ms, respectively. And during testing, we came across an unexpected bonus: The drive made only slightly more noise than our PC's internal power-supply fan! At this point, our excitement was palpable.

So how did the veloCD 24x actually bungle its landing? In short, we were devastated by the drive's performance in duplicating copy-protected CDs in RAW mode. A process that took minutes on Yamaha's 20x took more than 20 hours on the veloCD! TDK says it has switched drive manufacturers since releasing its 16x model and that the problem will be cleaned up at the firmware level sometime in the future. Unfortunately, we aren't reviewing future firmware. We're not advocating CD piracy, mind you; there are many legitimate (and legal) reasons to make disc images and backups of protected software.

We also discovered some quirks while ripping audio tracks located on the outer extremities of some discs (see story, page 23). When ripping entire audio CDs in one fell swoop, the drive would simply abort all activity when it hit the final two tracks. This problem is endemic to many high-speed drives, and for what it's worth, we were able to rip the tracks individually with success. Nonetheless, a perfect burner would have gracefully slowed down its ripping speed rather than throw in the towel.

The TDK 24x earned a spot in our Dream Machine for its record-breaking performance, but now is the time to raise our standards for optical drives. In this age of 24x, speed gains are becoming less important than consistency. It's high time we become much more critical of performance flaws and unpredictable behavior.

And so it shall be. To receive a Perfect 10 verdict and Kick Ass award, TDK needs to shine up its firmware (so the veloCD 24x can rip in RAW mode at reasonable speeds) and smoothly lower its disc speeds during audio extraction (so the drive can reliably rip audio from the extreme edges of 74-minute music CDs). Until then, there's no shame in a 9 verdict.

—LOGAN DECKER

THE BUNDLE

Adobe ActiveShare, InCD, Nero Burning ROM, MusicMatch Jukebox, TDK Digital Mixmaster

BENCHMARKS

Average data transfer (MB/sec)	3.5
Average drive rating	23.96x
Random/full-stroke seek (ms)	102/183
Audio extraction (min:sec)	2:36
Data CD burn (min:sec)	4:06
CPU utilization (at 8x)	11%

The audio extraction test uses a 72-minute audio CD. The data CD burn test uses the bundled CD-mastering app to create a 647MB CD-R. For more information on how we benchmark optical drives, go to the Mag Reprints section at Maximumpc.com.

MAXIMUMPC VERDICT

VeloCD 24/10/40
TDK

WHAT WE LIKE

The 24x isn't just the fastest burner we've ever tested—it's an intelligently designed and packaged drive that's appropriate for experts and novices alike.

WHAT WE HATE

TDK has made great strides in mitigating the problems of high-speed CD burners, but the RAW mode copying is too slow, and engineers still need to work on getting the drive to slow down during problems with digital audio extraction.

800.835.8273 www.velocd.tdk.com
$280

9

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CMC CyberBoy

A pocket entertainment center—*not to be confused with a PDA*—that shoots pics and handles your schedule

All aboard: About the only doohickey CyberBoy doesn't have is a printer.

Sure, it *looks* like the latest PDA from Palm or Handspring, but the CyberBoy is really a "pocket digital entertainment center." Those who don't speak marketingese can just call it a souped-up MP3 player and digital camera, all in one.

Flip-click: You can enter a new contact on the front panel, then flip the CyberBoy over to snap a picture.

The first thing the folks at CMC wanted us to know is that CyberBoy is not a PDA. It's a "pocket digital entertainment center," and it's not meant to compete with high-end Palm units or digital cameras. Although we had a good time futzing with this gadget's long list of gee-whiz features, we sure hope the CyberBoy's marketing department makes the "not a high-end PDA" message very, very clear to consumers. If you purchase a CyberBoy expecting the sophisticated stylings of a Palm M505, you're going to be sorely disappointed.

On the other hand, if you're a college student who wants to sneak a fun, PDA-like toy into lecture classes, you're gonna love this thing; it's like a Handspring with all the modules built in. CyberBoy has all the interface doo-dads you'd see on an MP3 player—volume control, Play/Rew/FF buttons, a Hold switch that locks all the buttons—plus a built-in, low-grade digital camera (with a focus knob, even!), a voice recorder, and an FM tuner. The audio quality ranks up there with most MP3 players, which means it sounds about as good as anything can sound when played through a set of ear bud headphones. It'll also hold addresses and keep your schedule, though these functions are clearly not the CyberBoy's focus. The schedule and contacts functions are easy enough to use, but certainly less intuitive and robust than those we've seen in a Pocket PC, for example. Still, you can synchronize your dates and digits with *Outlook* on your PC or via the *CyberBoy Manager* software.

CyberBoy sports far more buttons than you'll see on a Palm or Pocket PC (oops, there we go again comparing them), but navigating between apps and operations is effortless. There's a Home button (identifiable by the little picture of a house on it) that takes you to an icon repository from which you can launch any application on the unit. There's a Menu button that launches drop-down menus in an application. And across the bottom of every screen are small icons representing the device's major functions, so moving among them at any time is a snap. CyberBoy understood our block-letter scrawls and mirrored our writing onscreen while we scrawled, which made text entry easier. The input window is divided into three parts—one for capital letters, one for lowercase, and one for numerals—so there's no weird keystroking necessary to swap between them; you just make an entry in the appropriate space. We also dug the fact that CyberBoy takes either a rechargeable battery pack or two AA batteries, and that it's equipped for both USB and serial connectivity.

By far, our biggest complaint concerns the CyberBoy's screen. The 240x420 grayscale LCD is hardly tops in terms of resolution (though digital images we snapped with the integrated camera weren't too muddy to be seen onscreen) and is covered by a thick film that has the consistency of an overhead projector transparency. We don't know what the screen surface is made of, but we do know it's off-putting; when you input data with the plastic stylus, it feels like you're actually scratching the screen. Yuck!

CyberBoy is a locked box. In its current iteration, no apps can be added, though CMC says that future generations of the Boy will be equipped to receive add-ons. As it ships, CyberBoy comes pre-loaded with a fair amount of fun distractions, including *MineSweeper* and *Poker*. Thankfully, it's equipped with a slot for a SmartMedia card for image and MP3 storage. The 8MB of storage built into the unit is not nearly enough for any device that even remotely purports to be an MP3 player or a digital camera—or both, for that matter. We hope that in the future the SmartMedia function will support third-party application storage as well. After all, any "entertainment device" should be upgradeable to include additional forms of entertainment.

Overall, we were smitten with this first iteration of the CyberBoy. It needs a better screen and third-party application support, but you can rest assured we'll keep our eyes on the CyberBoy lineage for quite some time.

—KRISTEN SALVATORE

THE SPECS

Screen res	240x420, grayscale
Viewable area	2.25 x 3 in.
Processor	33MHz ARM7
Memory	8MB SDRAM, 8MB flash
Bundle *CyberBoy Manager*, ear bud headphones, AC adapter, rechargeable battery, USB cord, carrying case	

MAXIMUMPC VERDICT

CyberBoy
CMC

WHAT WE LIKE

There's a buffet of gadget-y options in a pretty small package, and USB connectivity rocks our world.

WHAT WE HATE

Putting stylus to screen is like dragging fingernails on a chalkboard, and we'd like the option to add additional apps and games.

925.829.2454 www.aeeus.com
$350

8

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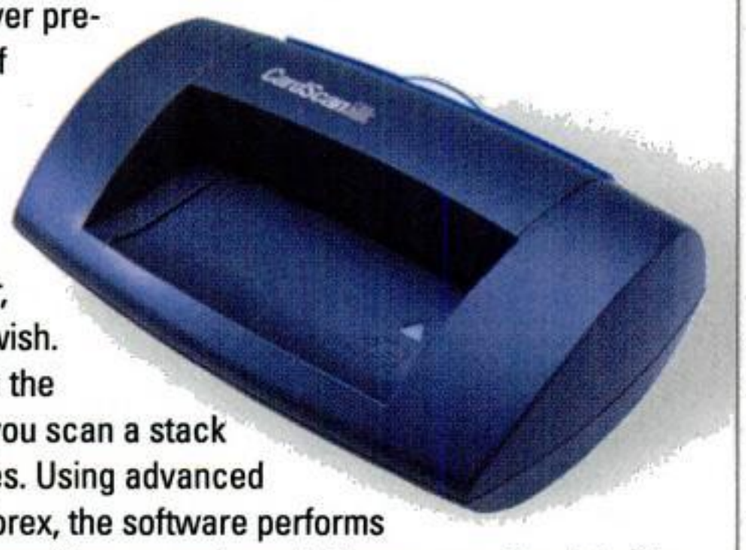
Plug and Play

Cool card scans, USB switching, stylish speakers, and a laptop accessory that lags

Corex CardScan Executive 600c



We've gushed over previous versions of Corex's line of business-card scanners, but we always pined for color scans. With the new 600c scanner, Corex finally answers our wish. For people not familiar with the CardScan, the device lets you scan a stack of business cards in minutes. Using advanced algorithms developed by Corex, the software performs quick optical character-recognition on each card, then parses the data into the correct fields of a virtual Rolodex. The data in turn can be synchronized with many of today's popular PDAs and PIM software.

WHAT WE LIKE: Color card scans are extremely cool—but that's not the only extra you get. Also useful are an indicator light that tells you when the scanner's ready for another card, a catcher tray that keeps scanned cards from falling behind your desk, and USB (instead of slower serial) connectivity.

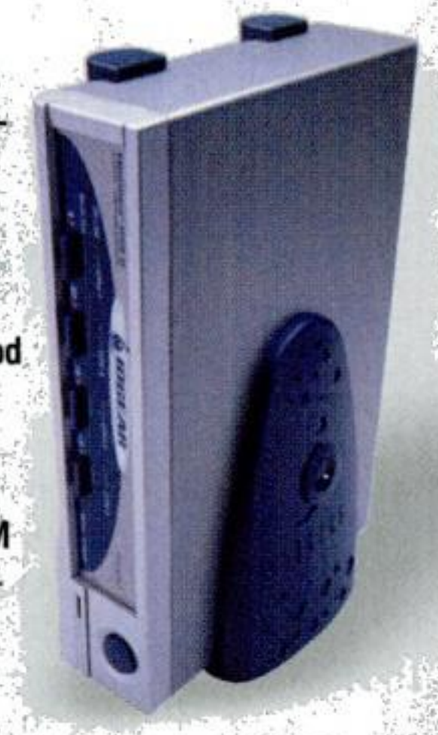
WHAT WE HATE: Scanning 27 color cards in three minutes is faster than you can type them into a contacts database—but that happen even faster in a perfect world.

—GORDON MAH UNG

MAXIMUM PC VERDICT: 9

$300, Corex, www.cardscan.com, 800.942.6739

IOGEAR MiniView II



We're not sure if we like the idea of IOGEAR's MiniView II. Unlike the typical PS/2-based keyboard, video, and mouse switchers (KVMs) that let several PCs share one set of input and display devices, the MiniView II is a USB-based device that lets you run your PC alongside—gasp—a Mac. OK, maybe that's not good enough reason to dislike the MiniView II. In fact, there's a lot to like about it. It supports a video resolution up to 1920x1440, and that's higher than most KVMs. Also unlike other KVM packages, it includes four cables—two 4-footers and two 6-footers—to connect your PCs. This cabling might add up to about $100 if purchased separately.

WHAT WE LIKE: The MiniView II features the usual KVM amenities, such as an onscreen display of what machine you're using and keyboard control for machine switching. Like other brands, it can daisy-chain up to 64 machines by using other MiniView II KVMs.

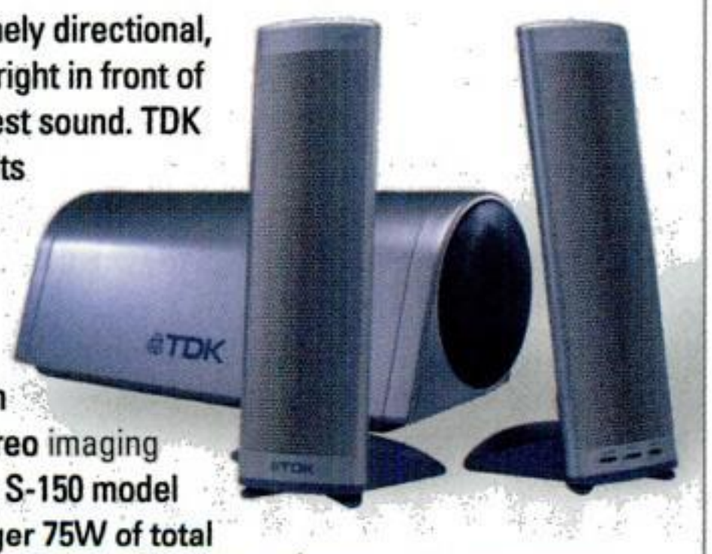
WHAT WE HATE: We would like audio support, as well as one PS/2 port for better flexibility. There seemed to be a slight performance hit using a USB mouse to play games.

—GORDON MAH UNG

MAXIMUM PC VERDICT: 9

$300, IOGEAR, www.iogear.com, 888.999.2836

TDK Tremor Multimedia Speakers



Most PC speakers are extremely directional, which means you have to sit right in front of them if you want to get the best sound. TDK says the flat-panel drivers in its Tremor Multimedia Speakers solve the problem with an omnidirectional dispersion pattern that widens the "sweet spot," i.e., the position at which you get the best stereo imaging and overall audio quality. The S-150 model we reviewed features a meager 75W of total RMS output power. Each of the two satellites pumps out 16.5W through 3-inch drivers.

WHAT WE LIKE: The satellites do in fact deliver better omnidirectional performance than traditional speaker designs. You won't get perfect stereo imaging unless you're directly in front of the speakers, but audio quality remains balanced, bright, and clear at virtually all angles.

WHAT WE HATE: The 3-inch drivers in the satellites buzzed noticeably at around 2KHz on our oscillator-sweep test. Music playback at top volume sounds harsh, and the subwoofer drops out. The volume, treble, and bass adjustments are miniscule wheels.

—ROB PRATT

MAXIMUM PC VERDICT: 5

$150, TDK, www.tdk.com, 800.835.8273

LapWorks Original

Once in a while, someone invents a product that revolutionizes the human experience. This isn't one of those products. OK, this really, really isn't one of those products. The LapWorks Original is a folding polycarbonate surface that you can prop your notebook computer on while you're working. Weighing 1.5 pounds and measuring about 20x11 inches, the LapWorks features a rubberized surface so your computer won't slip onto the airport carpet. We honestly don't know why anybody would ever buy this product, so here are two ideas for improvement. First, why not Kevlar? If the LapWorks was made of Kevlar, it could pull double duty as a bulletproof shield. Second, cupholders. Yep, you get the idea.

WHAT WE LIKE: As much as we'd like to completely malign the LapWorks, it does do one thing well: It insulates your private parts from the heat generated by 1GHz notebooks. For some people, that's worth the $35.

WHAT WE HATE: What's there to hate about a piece of plastic that folds in half, except that you could get the same by stealing a tray from the airport cafeteria?

—GORDON MAH UNG

MAXIMUM PC VERDICT: 4

$35, www.lapworks.com, 877.527.9675

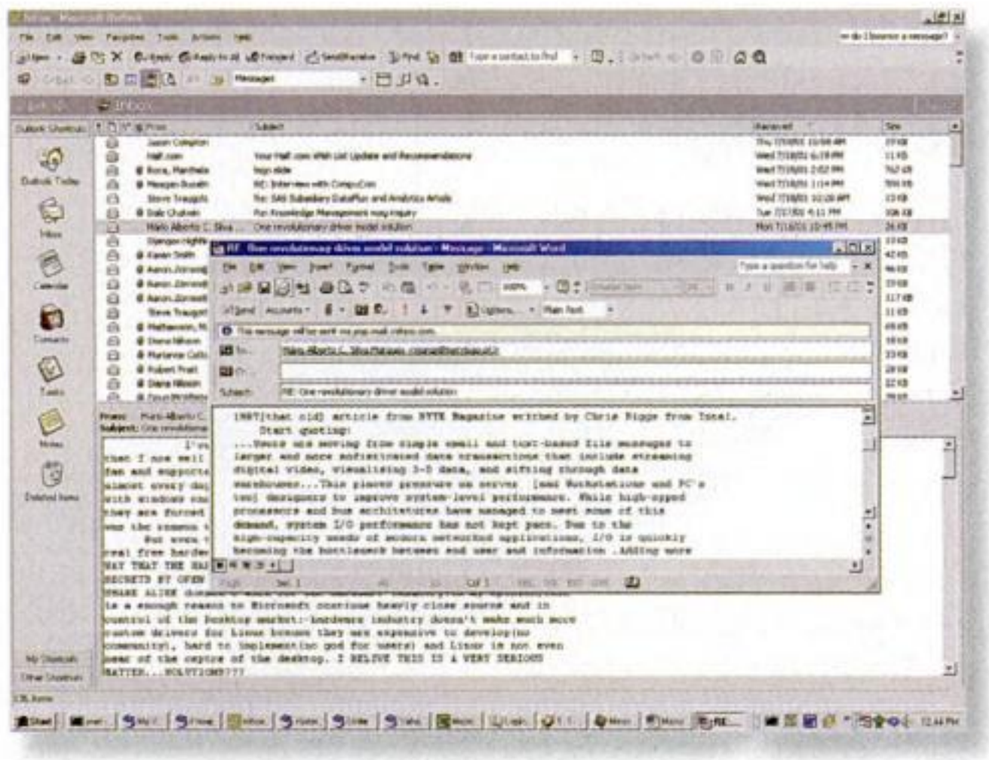
Reprinted material

Microsoft Office XP Professional

Incremental upgrades for a hefty price tag

If you take PC productivity seriously, sooner or later you'll need to make a decision about *Office XP*. Corel *WordPerfect* is an adequate substitute, but it has significant interface quirks that disorient people who've cut their teeth on *Word*. Lotus *SmartSuite*, meanwhile, is hard to find outside an IBM PC bundle, *StarOffice* is free but uninspiring, and *OpenOffice* is still very much a work in progress.

So that leaves *Office XP*, a *Maximum PC* 7 verdict if there ever was one. *Office* loyalists will find that installing the latest version requires a surprisingly lengthy time investment. Although the five primary *Office XP* components clock in at under 200MB, the installer does a great deal of preliminary work remolding Windows, primarily by installing a lot of undocumented Microsoft update components. *Office XP* spent more than five minutes updating our main test system and nearly 15 minutes updating a slower notebook, both of which run Windows 98SE. It's a time-consuming, two-reboot process.



Word up! Instead of the crippled message editor of *Outlooks* past, the new version uses *Word* for e-mail editing.

Word now includes a multiple-user revision system that allows several different people to mark up a document at once, then later merge the document into a master, corrected copy. French and Spanish word phrase translation dictionaries are also included.

The single biggest surprise in the new *Word* is that it almost resembles a legitimate visual HTML tool. Any HTTP address can be opened as a *Word* document, although *Word* seemed to be pestering the destination web server for write privileges, which required canceling a number of username/password requests before the HTML page would load properly. It's still not the right tool for building a complete web site, but for emergency maintenance or quick appropriation of someone else's design, it's surprisingly adequate.

Outlook fans will be happy to find a somewhat more humane process for basic configuration, including a quick test that validates mail servers, usernames, and passwords. *Outlook*'s mail client software now uses *Word* as its default message editor instead of the rather weak internal editor employed in the past. Is this a positive change? That's your call—but we think using *Word* to compose e-mail messages is akin to swatting flies with a sledgehammer.

PowerPoint's changes are minimal, primarily concerned with making the team revision/commentary process easier, and streamlining the application of multiple effects to a slide or slide transition. Perhaps most telling about the overall lack of movement in *PowerPoint* is the fact that, as of press time, Microsoft had not yet updated its free, stand-alone *PowerPoint* viewer to reflect any feature changes that occurred during the transition from *PowerPoint 2000*.

For the left-brained among us, *Excel* and *Access* both add XML data support. Excel's analytical capabilities, which have grown considerably since the mid-1990s, have been further expanded, and *Access* now has, well, access to some of Microsoft's PivotTable algorithms, as well. If *Access* databases aren't your cup of tea, *Office XP* Standard omits *Access*, but saves you just $100 on the full version or $90 on the upgrade. Still, unless you're planning to dabble in application development in order to get that big promotion, you may never need it.

The unsung extras of *Office XP* include the steady, reliable Microsoft *Photo Editor*. It's long been a fine choice for basic scanning and image conversion, made better by the elimination of a few minor annoyances such as a lack of compressed TIFF support. The *Document Imaging* tool does better-than-nothing OCR on scanned real-world texts, but the output can get needlessly cluttered in a hurry (when it works correctly at all). We found that Document Imaging's integration with *Word* was also somewhat dicey.

Here's a tip for the Justice Department: Next time you want to argue that Microsoft is a monopoly, just point to *Office XP*'s feeble printed documentation—because only a monopoly could get away with selling $600 software accompanied by such an inadequate user's manual. If you liked your Windows Instruction Pamphlet, you'll love all 190 non-indexed pages of the *Office XP* manual, which mostly serve as promo material for the *real* manual that Microsoft Press wants

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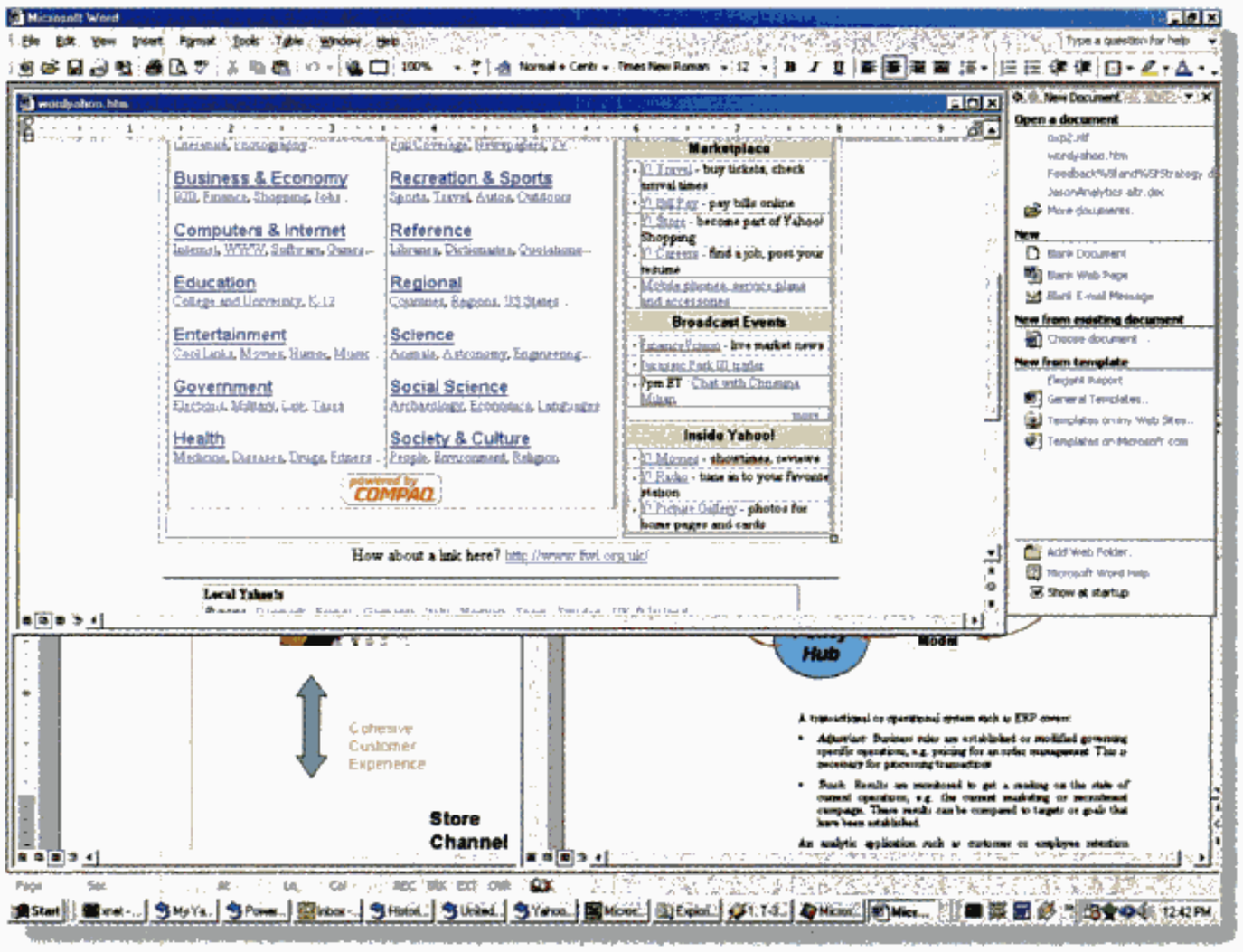
to sell you. For nearly $600, a little offline help is warranted, needed, and deserved. In contrast, Corel typically ships documentation the size of the Greater Ottawa phone book with *WordPerfect*. On the flipside, *Office XP*'s bundled training disc is actually better than we expected. It comes with interactive mini-courses on some of the more intricate features of each *Office XP* application, but it's still no substitute for a solid collection of reference text.

Despite promises that it will be retired any day now, Microsoft's loathsome paper clip Office Assistant lives and remains inexplicably enabled by default. Don't bother with the "type a question for help" in the standard toolbar of Office applications, either. Your best bet is still to disable the paper clip and whack F1 for the Help index when a problem arises. The main application windows resize to accommodate the Help window, although the Help window often automatically expands shortly after opening, making the gesture useless.

The list of new features in *Office XP* is not terribly long. It's as though the company has run out of ideas—which may not be far from the truth. But here's one they seem to keep missing: multithreading. There's no good reason for an Options window to freeze up the underlying application, yet this is practically a hallmark of Microsoft software. The floating Task Panes are a step in the right direction, but with a mess of 11 tabs on *Word*'s Options menu, one could be in the soup for quite some time. Without the freedom to check the behavior of the program and appearance of documents in the middle of editing options, it's hard to make the right choices.

Microsoft's marketing people would undoubtedly disagree, but we think it's high time for *Word* and *PowerPoint* to be combined into a single monolithic application. Both do essentially the same job and serve the same goals: presenting text, graphics, and data in some fixed region on a screen and/or printed page in order to convey an idea or make a statement. Come now, it's not like Microsoft has an aversion to monstrous



One of the finest improvements to *Office XP* is a visual HTML editor in *Word* that does a great job at making emergency repairs on web pages—or grabbing "inspiration" from someone else's layout.

software—*Word* has been overkill for most users for at least five years, and we're talking about a company on the verge of releasing a desktop operating system that requires one-quarter of a gigabyte of RAM to run well. So call a spade a spade, Microsoft, and stop pretending that "presentations" are somehow vastly different than "documents."

Upgraders take note: Microsoft only honors upgrades from the full versions of Office 97 and 2000, not from competing products or individual applications such as *Word* 2000. The fact is that *Office XP*'s biggest competition is Office 97 and Office 2000, and despite making some welcome adjustments that blend the strengths of both into the new version, the upgrade hardly sells itself.

In truth, *Outlook*'s security gaffes are the major weakness of the last two *Office* incarnations, but that's hardly a good reason to upgrade. For starters, Microsoft should and does provide security patches for the older *Outlook*s, and it seems wrong to turn over an extra $329 in the hopes that your e-mail client of choice won't play an active hand in sabotaging your computer.

Like the 2000 series before it, *Office XP* perpetuates Microsoft's triple-code-key Product Activation system. It is as unwelcome in "version 2002" as it was in "version 2000." Complete newcomers should consider very carefully whether they need to make a software investment more expensive than the bulk of their hardware. If you don't have an obvious need for at least three of XP's five major applications, you're probably spending most of your money on shelfware.

—JASON COMPTON

MAXIMUMPC VERDICT

Office XP Professional
MICROSOFT

+ WHAT WE LIKE

Microsoft *Office* continues to do a lot of things, and does a lot of them quite well. *Word*'s HTML capabilities aren't a complete joke, and supporting players like OCR and image editing are welcome.

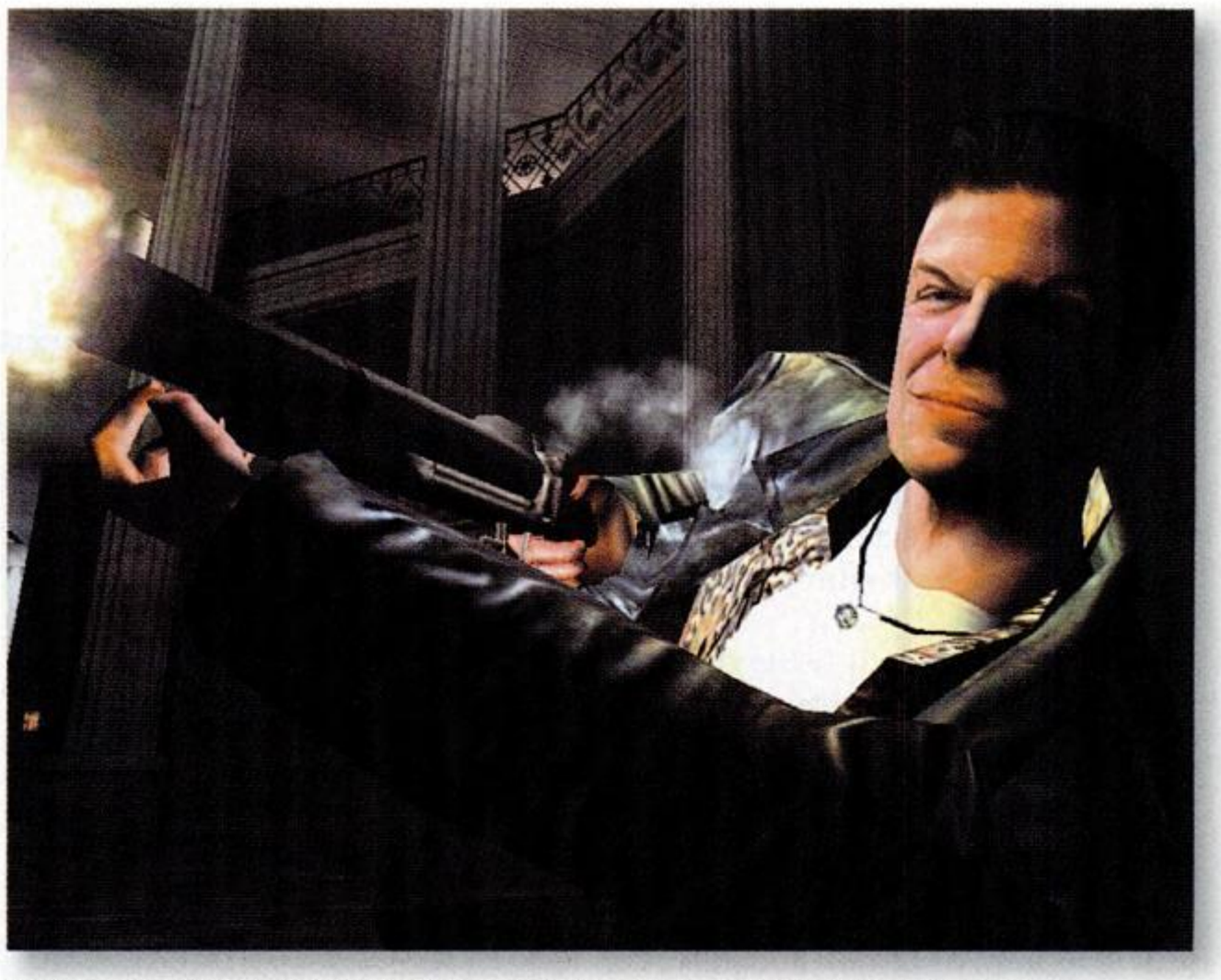
– WHAT WE HATE

The Microsoft-standard substandard documentation is a disgrace. And there aren't many compelling reasons to upgrade.

425.882.8080 www.microsoft.com
$579 ($329 upgrade)
7

Max Payne

The pleasure of pain



Notice the highly detailed weapon model, complete with particle effects for smoke and muzzleflash.

Familiarity breeds contempt, which might explain why the buzz about *Max Payne* turned sour this past year. It seems like we've been reading press about this game ever since someone at 3D Realms said, "Max Payne would be a cool name for a game, wouldn't it, George?"

Showing up a year-and-a-half late didn't help matters, either.

But all is forgiven now that publishers G.O.D. Games and 3D Realms have given us this debut title from Remedy, a development team from Finland (as in Finnish—they even have names like Jaakko and Anssi). *Max Payne* allows G.O.D. Games, which had few hits and was dissolved shortly after the game was published, to go out with style. *Payne* takes the third-person shooter, imbues it with a dumb—yet highly effective and appropriate—pulp-fiction style, and gives it a killer hook.

The entire game is a combination of Hong Kong action flick, comic book, and old-fashioned Chandleresque film noir. *Max Payne* is an undercover cop who gets sucked into the New York City underworld. Haunted by the murder of his wife and child, he follows a tangled, somewhat convoluted trail through the politics and shifting loyalties of the mob. *Payne's* writer threw in pretty much everything he could think of, including trippy dream sequences and the occult, but it holds together nicely. The story is told through Max's narration, cut scenes, and oddly stylized "graphic novel" panels. Dialog is incredibly overripe, but it works in context and keeps everything moving like gangbusters.

Note the high-resolution features on Max's jacket and the floor. The particle-effect flames are startlingly realistic too.

Payne's nonstop plot and highly cinematic style make *Half-Life* and *Elite Force* look like *Doom*.

Part of this pacing is thanks to the narrative, and part can be attributed to terrific level design. You're always moving, and always doing something. Gun battles are the highlight, with Remedy taking the visceral, slo-mo style of a John Woo gun battle and mixing it with the "bullet time" effect of *The Matrix*. Bullet-time works by slowing the action so you can aim more effectively and actually dodge bullets. The effect is impeccable: Bullets leave little tracers so you can follow their trajectories, and even the game's sound deepens in pitch and slows down. You can use the bullet-time feature while standing still, to simply stop time for better aim, or while jumping in any direction for an aerial, Chow Yun Fat-style jump-and-shoot effect. You can only use it for short amounts of time, as monitored by an onscreen meter, but you always get more bullet-time by killing more bad guys. Much more than a gimmick, it integrates so flawlessly with the pace of levels and the toughness of enemies that it never unbalances the game.

Max Payne looks fabulous and runs great even at 1024x768 on a midrange system. Load times are about the shortest we've ever experienced. Since this is a heavy-duty die-and-reload game, fast loads are essential. Weapon choices are what they should be: double-fisted handguns, shotguns, grenades, Molotov cocktails, and so on. The game's only holes are its dream levels, which stop everything dead and are remarkably ham-handed and annoying. For example, in one sequence, you're forced along a tiny path. You can't see where you're going due to the camera's perspective, but you can still easily fall and die—over and over again. The dream sequences have an appealing visual style, but the gameplay is horrible and mars the overall gaming experience.

The experience remains overwhelming positive, however. Many people will balk at the game's paltry play time, which clocks in at around 12 hours. Since our 12 hours of gameplay were among the best 12 hours we've spent gaming this year, we're not going to complain. *Max Payne* takes the familiar and often tired format of the third-person shooter and, by giving it style, pace, and a single, new gimmick, uses it effectively in one of the most absorbing games of the year.

—THOMAS MCDONALD

MAXIMUMPC VERDICT

Max Payne
REMEDY

+ WHAT WE LIKE

The bullet-time effect is a great gimmick. Exciting gunplay and camera action make you feel like you're in the middle of a John Woo movie.

– WHAT WE HATE

Though they were some of the best hours we've had gaming all year, *Max Payne* lasts just 12 hours from opening sequence to final credits. Dream sequences suffer bad gameplay, too.

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8

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Bullet-time is the one true innovation in *Max Payne*. Action can be slowed down to the point where you can see every bullet fired by you or the enemy. You can also see clipping errors, as in this shot, where Max is shooting the bad guy through a solid ceramic toilet.

The action of each weapon is accurately modeled, down to the general trajectory of ejected shells.

The high-resolution textures in *Max Payne* greatly add to the ambiance of the game. What was the last game you played that had fully textured Persian rugs and crown molding?

It seemed like these guys could use a pick-me-up, so we shot 'em with an M-79 grenade launcher.

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Jump Cuts

A bad port, a new-age RTS, massive *Anarchy*, and a screen-capture app masquerading as a Zen riddle

Alone In The Dark: The New Nightmare

Alone In The Dark: The New Nightmare might well be the *Plan 9 From Outer Space* of survival horror games. After an introductory full-motion video that's ruined by heavy video compression, you begin playing in *Resident Evil*-style parallel scenarios. Regardless of whether you play as "the shrill harpy" or "the guy in the suspiciously tight outfit," you're doomed to the same routine. You'll spend hours and hours running back and forth through rooms you've been in a million times, finding keys, fetching statues, and trying to ward off recently deceased Abercrombie and Fitch models in khakis, all while waiting for the storyline to lurch forward.

WHAT WE LIKE: The game never crashed, and the flashlight illumination, while neither original nor well-implemented, does add atmosphere.

WHAT WE HATE: Just about everything else. With meandering plotlines, crummy 640x480 backgrounds, and tacky audio loops, this yawner has all the ambition and flair of a direct-to-video movie.

—LOGAN DECKER

MAXIMUM PC VERDICT: 3

$40, Infogrames, www.us.infogrames.com, 818.251.3300

Startopia

First, translocate *Dungeon Keeper 2* to a donut-shaped space station. Now add an acerbic, advice-giving computer and a space trader who hustles overpriced wares. Finish off the mix with a bubbly New Age music score, and you have *Startopia*, a gimmicky real-time strategy romp. You'll find yourself placating residents with love nests and discos and trading goods with all the ships that dock at your space station. The voice work is top-notch, the interiors are dazzling, and a well-honed sense of humor permeates the game.

WHAT WE LIKE: Interiors look great at every resolution, and a smooth 3D interface lets you travel through space-station options at light speed.

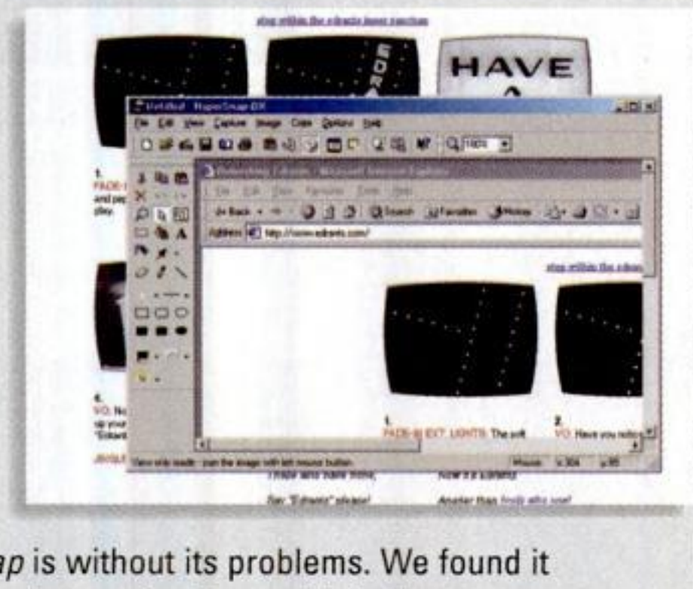
WHAT WE HATE: The flimsy manual and vague tutorials are as cryptic as the sphinx's riddle. You'll have better luck figuring out how to play the game by just playing it. But even then, you still won't be able to unravel the motivations behind the happy-go-lucky, blue-collar warthogs or the handful of alien Luddites who randomly bomb populated hotspots.

—EDWARD CHAMPION

MAXIMUM PC VERDICT: 7

$40, Eidos, www.muckyfoot.com, 888.900.6996

HyperSnap



Sooner or later, you'll want a third-party screenshot application; your Print Scrn button just isn't the end-all, be-all of screen-capture goodness. In this respect, *HyperSnap* has several advantages over its competitors: It produces a distinct camera sound every time a picture is taken, and, more importantly, it's extremely flexible. This is not to suggest that *HyperSnap* is without its problems. We found it strangely ironic that a screenshot application couldn't take a screenshot of itself! The screenshot above had to be taken with another screen-capturing app.

WHAT WE LIKE: The program is extremely pliant to the needs of a screenshot junkie.

WHAT WE HATE: Some of the convoluted forms of capture (with equally inexplicable hotkey combos, like Shift-Control-F, that can't be readily configured) may be daunting to the neophyte. And this latest version has impractical icons that are pretty close to useless.

—EDWARD CHAMPION

MAXIMUM PC VERDICT: 8

$35, Hyperionics, www.hyperionics.com, 425.969.2775

Anarchy Online

Set on the harsh world of Rubi-Ka and borrowing from many sci-fi traditions, *Anarchy Online* sends players on an endless variety of random missions, or teams up players to spread their own brand of order, justice, or chaos across the desert planet. Launched in late June, the world—and its client engine—are stable, but they're both still works in progress.

WHAT WE LIKE: You can join one of the planet's two rival factions or remain neutral. Switching between third- and first-person views on the fly allows all types of gamers to find a comfortable game style on most maps.

WHAT WE HATE: There are some serious clipping problems, so walking halfway into walls and scenery is all too common. The documentation doesn't provide enough gameplay tips and lacks helpful advice on the myriad skills, pop-up screens, and classes, and there's a notable lack of human assistance—most of the "guides" are bots that answer a limited set of questions. $50 up-front is too steep for a subscription title.

—JASON COMPTON

MAXIMUM PC VERDICT: 6

$50, Funcom, www.funcom.com, (no U.S. phone)

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Coming Next Month

IN THE MAXIMUM PC NOVEMBER ISSUE!

Hardware Explosion!

Every once in a while, a spectacular new technology takes the PC world by storm. But this November, they're all coming at once! Take your first look at an unprecedented wave of hot new technologies, including the Radeon 8500 videocard, the Matrox G550 videocard, Creative Labs' next-gen Audigy soundcards, the first USB 2.0 peripherals and Bluetooth devices, as well as DVD+RW recorders, Palm OS4 PDAs, 2GHz Pentium 4s, new Intel chipsets, Minolta's new 5-megapixel camera, and more.

Windows XP Reviewed!

We reveal the definitive benchmarks of Microsoft's new OS, along with comparisons to Windows ME and Windows 2000, and an Aqua vs. Luna head-to-head. Plus, the coolest things you can do with Windows XP (if you don't work for the DOJ), and an investigation of how Product Activation affects hardcore upgrading.

The Top 10 Multiplayer Games You Aren't Playing

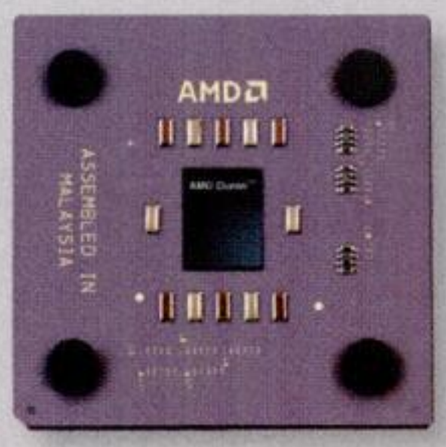
They're out there; you just don't know about 'em. *Yet.* Now that *Counter-Strike* is looking as familiar and tedious as the Starbucks around the corner, we'll show you the greatest online multiplayer games that are still flying below the radar.

How to Set Up a 5.1 Speaker System

We give you four case studies, explaining how to calibrate a home-theater speaker system—five satellites and one sub—in the most challenging environments imaginable.

Ultimate CPU Guide

You asked for it, and now you've got it: A handy cheat sheet detailing every major processor released since the debut of the Pentium III.



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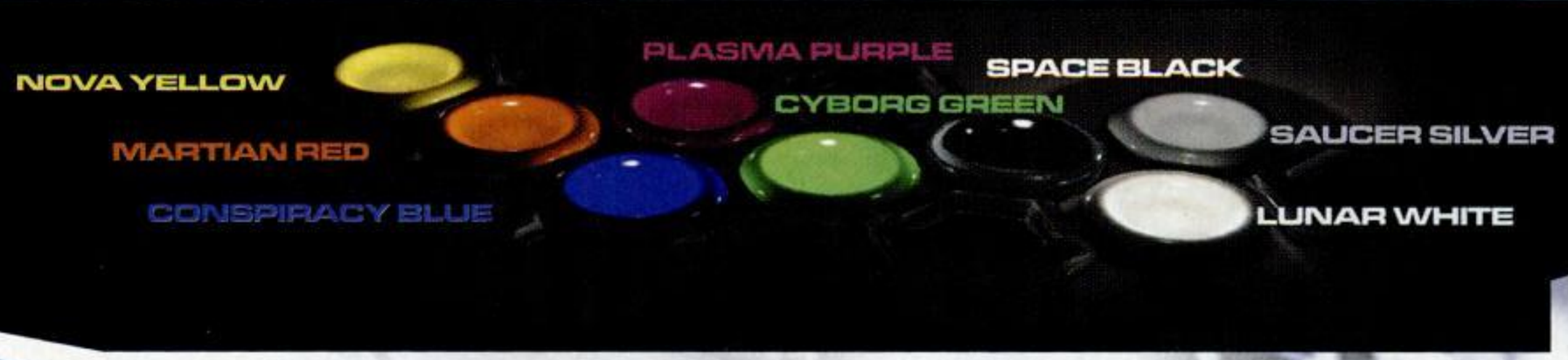

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- Mitsumi 1.44 MB Floppy Drive
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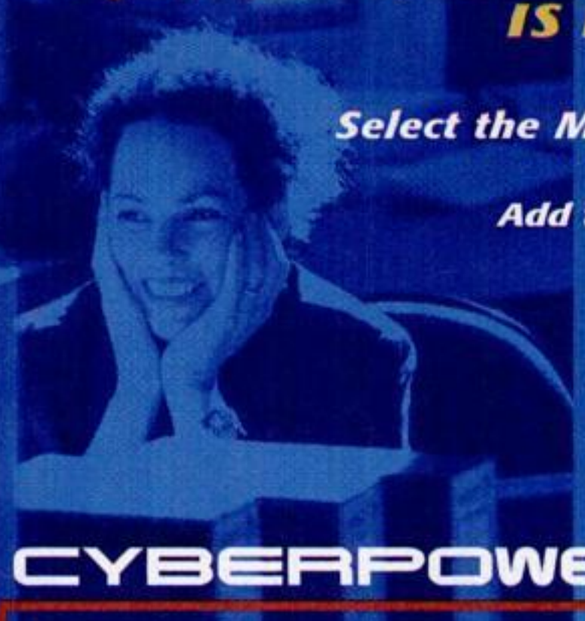

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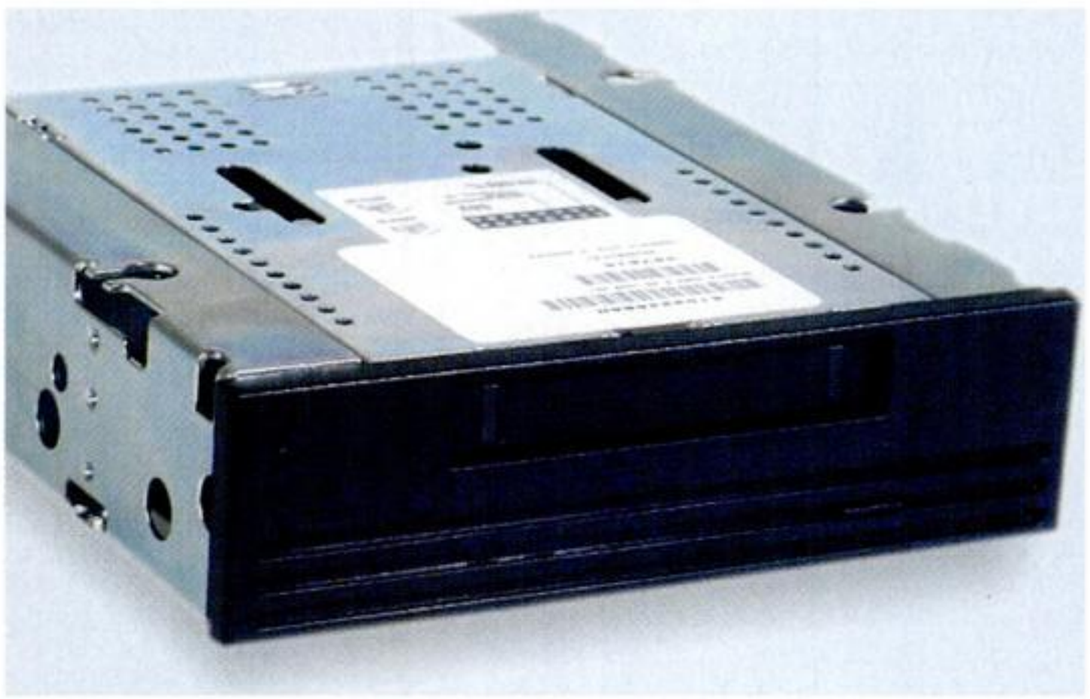

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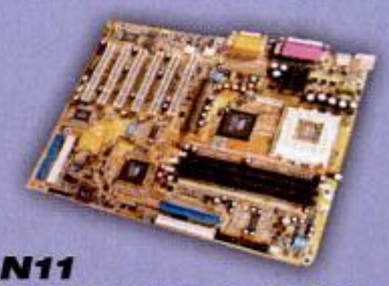

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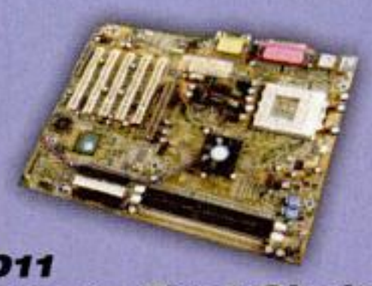

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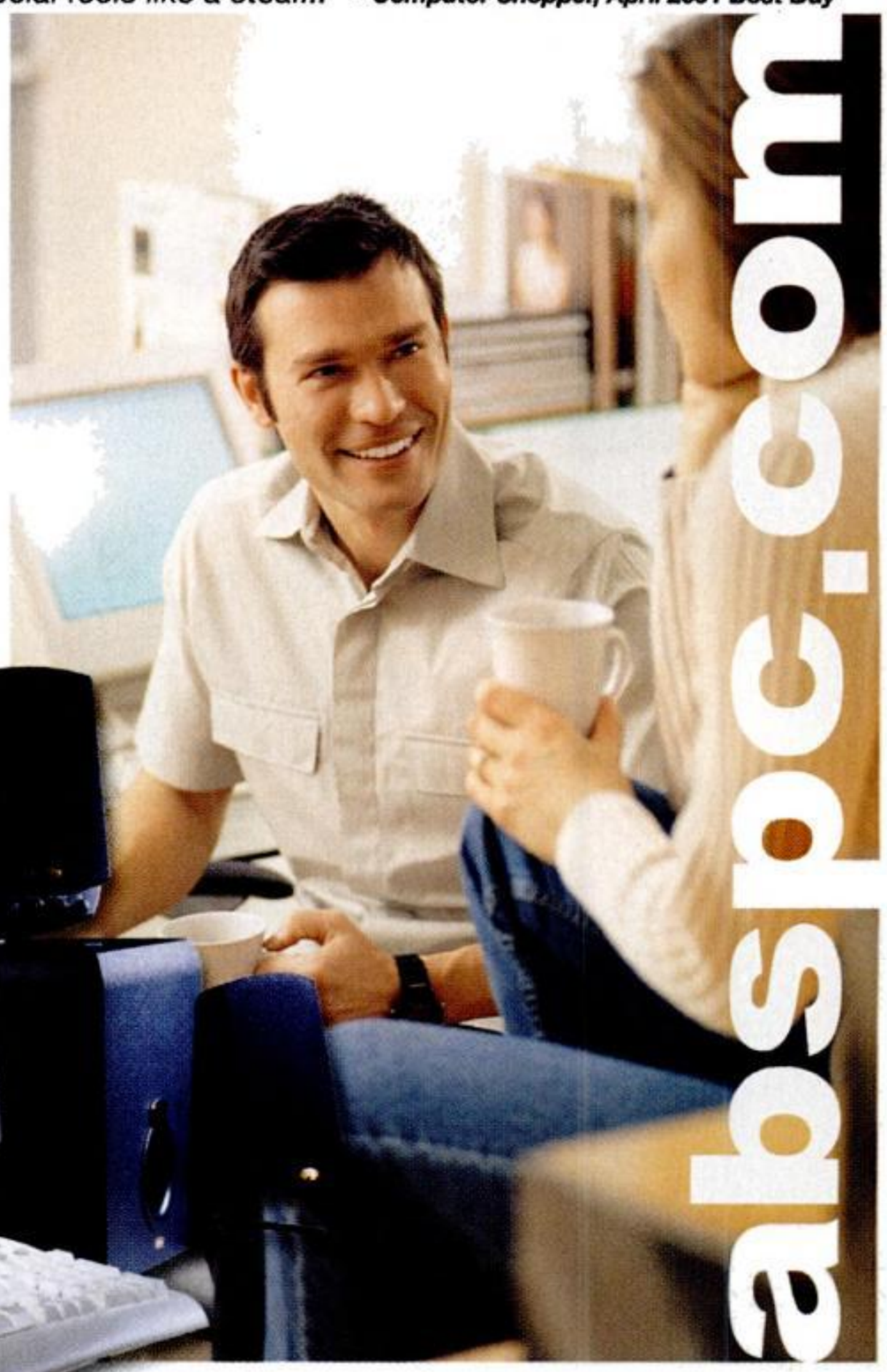

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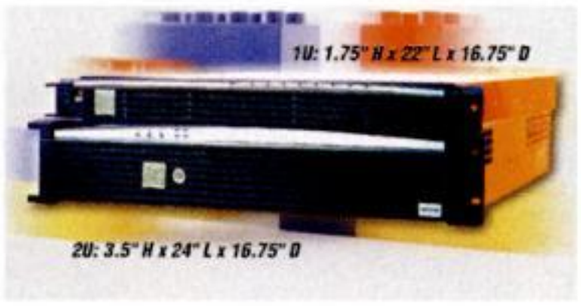

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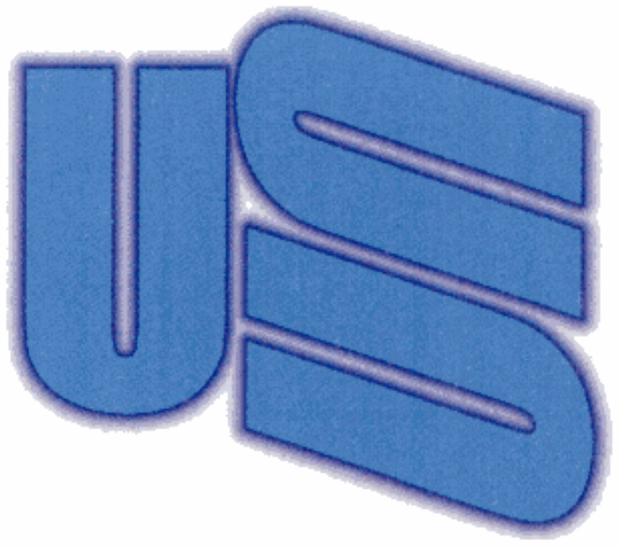

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Sound Blaster Live Value $50 w/5.1 $60
Sound Blaster PCI 128 $29

Video Cards

Elsa Gladiac 920 Geforce3 64 meg $409
Leadtek Winfast Geforce 3 64 meg $438
Asus V7100 Geforce2 MX 32 mg $104 w/64mg$128
Asus V8200 Geforce3 64meg Pure $418 Delx $454
Asus V7700 Geforce2 32meg Pure $162 Delx $194
Jaton Geforce2 MX-200 32 meg $67, MX 400 $88
Jaton Geforce2 MX400 64 meg $98
Elsa Gladiac 511 Geforce2 MX400 64 meg $104
ATI All In Wonder Radeon DDR $ 212
ATI Radeon 64 meg DDR w/VIVO $186
ATI Radeon 32 meg SDR $88
ATI Radeon VE 32 meg DDR Dual Display $87
Jaton NVIDIA TnT-2 32 meg $48 16 meg $40

Check Website for more Video Cards

Processors

Intel Pentium 4 for Socket 423 Motherboards
All come with 128megs RDRam
1.8 GHz. **(no** Ram) $599
1.7 GHz. $516 1.5 GHz. **$327 1.4** GHz. $215

Intel Pentium III Processors
Flip Chip FC-PGA for Socket 370 Motherboards
750 MHz (100)$153 800 MHz (133) $150
850 MHz (100)$158 866 MHz (133) $170
933 MHz (133)$188 1 GHz (133) $226

AMD Duron Processors
For Socket A Motherboards
950 MHz $69 900 MHz $68 850 MHz $57
800 MHz $52 750 MHz $44

AMD Athlon (Thunderbird) Processors
For Socket A Motherboards
850 MHz(200) $74 900 MHz(200) $75
1 GHz(200) $101 1.1 GHz(200) $101
1.2 Ghz(200) $110 1.3 GHz(200) $139

1 GHz(266) $92 1.2 GHz(266) $121
1.3 GHz.(266) $132 1.4 GHz.(266) $142

Memory

DDR SDram PC2100 (266) by Micron

128 megs	$25.10	with ECC $27.60
256 megs	**$46.60**	**with ECC $51.60**

RamBus RDRam
128 meg 800 MHz $46.80, with ECC $52.80
256 meg 800 MHz $100.80 with ECC $106.80

SDram 168 pin dimms by Micron

	PC-133	PC-100	PC-66(not Micron)
64 megs	$14	$14	$17
128 megs	$20	$20	$26
256 megs	$36	$36	
512 megs	$90	$90	

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AMD Duron Bare Bones Systems

AMD Duron Bare Bones Systems

Specifications:
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Cooler Master Extra Large Heatsink Cooling Fan
FIC AZ11-EA Motherboard with U100 Support
Mid Tower Case with 300 watt ATX power Supply
System is assembled and burned in for 48 hours

AMD Duron 750 MHz. $212
AMD Duron 800 MHz. $222
AMD Duron 850 MHz. $227
AMD Duron 950 MHz. $239
****Check web for current price

Options on our website to order it with Memory

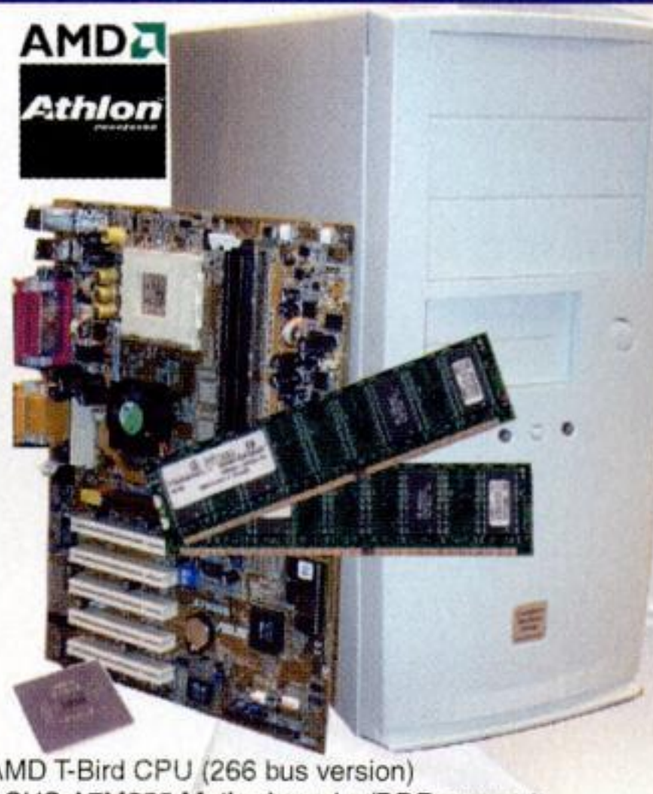
AMD Athlon Bare Bones Systems

AMD K7 Thunderbird Bare Bones Systems

Specifications:
FIC AZ11-EA Motherboard, Socket A
Mid Tower ATX Case w/ 300 watt power supply
AMD Processor of your choice below
Cooler Master Extra Lagre Heatsink and Cooling Fan
System is assembled and burned in for 48 hours

AMD T-Bird 900 MHz. - 200 FSB $267
AMD T-Bird 1 GHz. - 266 FSB $303
AMD T-Bird 1.2 GHz. - 266 FSB $320
AMD T-Bird 1.3 GHz. - 266 FSB $332
AMD T-Bird 1.4 GHz. - 266 FSB $341.20
***Check website for current prices

AMD Athlon and DDR Bare Bones



AMD T-Bird CPU (266 bus version)
ASUS A7**M266 Motherb**oard w/DDR support
DDR SDram PC-2100 by Micron
Mid Tower Case with 300 watt power supply
System is assembled and burned in for 48 hours
AMD 1.3 GHz. 266, 128 DDR ram $473.80
AMD 1.4 GHz. 266, 256 DDR ram $540.50
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300/350W	55/65	55	65
400W	110	110	110
500W	N/A	N/A	230
600W	N/A	N/A	300

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MODEL/ SPECS	Bare Bone	Dimension W.D.H	I/O ports	5.25"	3.5"	PCI	PCI ISA
103LPX socket 370	330	12.4x14.5x3.4	PS2 KB,mouse,VGA,USB,RJ45,2S,1P,AUDIO, GAME	1	1/1	2/1	or 1
104NLXBX slot 1	460	11.2x13.5x3.4	PS2 KB,mouse,VGA,USB,RJ45,2S,1P,AUDIO,GAME	w/FD & Slim CD		2/1	or 1
105LPX socket 370	375	11.9x12.6x3.4	PS2 KB,mouse,VGA,USB,RJ45,2S,1P,AUDIO,GAME, IR	1	1/1	2	0
106 socket 7	260	12.4x14.5x3.4	PS2 KB,mouse,VGA,USB,RJ45,2S,1P,AUDIO, GAME	1	1/1	2	or 0
108NLX socket 370	375	12.4x14.5x3.4	PS2 KB,mouse,VGA,USB,RJ45,2S,1P,AUDIO,GAME, IR	1	1/1	2	or 1
192 370/II Micro ATX	220	12.1x16.5x3.5	PS2 KB, mouse, VGA,2S,1P,AUDIO	1	1/1	2	& 0

Case Specification & Price List

Model	Price	Dimension W.D.H.	MB Size	5.25 Ext.	3.5 Int.	P.S.
R02/BARE	180/300	19x17.6x3.5	M.ATX	1/0	1/1	150W
R04B/W	275	19x24.3x3.5	ATX	1/0	1/3	250W
R05B	260	19x19.5x3.5	ATX	1/0	1/2	250W
R06B	250	19x20.2x5.25	ATX	4/0	1/5	300W
R08 B/W	1550/1800	19x22x3.5				
R10 B	175	19x17x7	ATX	3/0	1/1	300W
R14 B/W	215	19x21x7	B/ATX	3/0	1/3	300W
R15	295/510	19x24.4x7	ATX	6/0	2/2	300W
R16 B/W	225	19x18x7	B/ATX	3/0	1/2	250W
R20 B/W	275	19x20.5x7		8/0		300W
R21 B/W	275	19x18x7		8/0		300W
R22R/B/W	635/950	19x23.3x10.5	ATX	8/0	1/0	300W/R
R26R/B/W	630/850	19x22.6x10.7	ATX	4/0	2/4	300W/R
R28	290	19x17x8.7		8/0		300W
RSP	18	5.8x9.3x1.6			1	
RSM169-100	65/75	5.8x9.3x1.6			1	
001B	75	10x11.5x3		1/0		60W
001B1	65	8.3x10.6x2.8		1/0		50W
002B	88	6.9x14.6x5.8		2/0		60W
002B1	78	7.5x11.2x6.5		2/0		80W
004B	105	6.8x15.3x9.3		4/0		230W
004B1	100	7.5x17.3x10.2		4/0		200W
007B	180	7x15.8x13		7/0		250W
008B	280	8.4x20.2x18.3		8/0		300W
008B1	180	7.5x17.9x17.1		8/0		250W
105LPX/TV	255/275	11.9x12.6x3	LPX	1/0	1/1	90W
109(SP 98) bare	175	11x13.6x3.4	NLX	1/0	1/1	135W
111N bare	260	11.6x10.6x2.5	M.NLX	1/0	0/1	100W
192M.ATX/B	85	13.1x16.5x3.5	M.ATX	1/0	1/1	150W
224	75	17.4x18.8x6.1	ATX	3/0	2/2	230W
267	70	16.8x16.8x6.2	ATX	2/0	2/1	250W
271	85	17.3x15.9x5.5	ATX	2/0	1/1	250X
288	75	16.9x17x6	ATX	3/0	2/1	230W
325B	55	8x18.5x17	ATX	3/0	2/1	235W
327	72	7.5x16.5x17.3	ATX	3/0	2/2	230W
337	75	7.8x18.8x16.5	ATX	3/0	2/2	300W
338	55	7x14.7x13.8	M. ATX	2/0	2/1	145W
366	50	7.2x15.5x14.3	M. ATX	2/0	1/1	235W
367	55	7.7x16.5x17	ATX	3/0	2/1	235W
370	80	8.3x17.3x16.1	ATX	3/0	2/2	250W
392	80	7.5x17x17	ATX	3/0	2/2	250W
393	90	9x17.5x17.5	ATX	6/0	1/1	250W
396	55	8.3x17x15.5	ATX	3/0	1/3	230W
401	110	8.5x17.3x18	ATX	2/0	2/2	250W
408	80	8.2x19.8x18.4	ATX	3/0	1/5	250W
409	295	9.5x22x18.1	ATX	4/0	2/5	300W
411	67	7.2x17.2x16.8	ATX	4/0	2/1	250W
412	67	7.2x17.2x16.8	ATX	4/0	1/2	250W
413S/BL	67	8.5x19.5x18	ATX	4/0	2/1	250W
415	75	8.8x19.5x19.7	ATX	8/0	1/0	300W
422	70	7.7x16.6x18.1	AT	4/0	1/4	250W
424	70	7.5x18.9x16.7	ATX	4/0	2/1	250W
426B/W/S	70/75	7.5x17.5x19.3	ATX	3/0	2/2	250W
427	75	7.5x16.5x17.3	ATX	3/0	2/2	250W
436	70/85	8.6x18x15.6	ATX	3/0	2/2	250/300W
455	110	8.5x17.5x18.6	ATX	4/0	2/3	250W
465	185	9.3x17x17.2	XEON/ATX	2/0	2/2	300W
467	75/90	7.5x16.7x18.8	ATX	3/0	1/4	250W/300W
470	110	8.3x17.3x21.3	ATX	4/1	1/2	250W
471	110	8.4x17.5x21.3	ATX	3/1	1/4	250W
472	60	7.5x18x17.6	ATX	4/0	2/2	250W
474	285	7.8x17.2x17.2	ATX	4/0	2/2	300W
476	70	8x17.2x17	ATX	4/0	2/2	300W
478	155	7.9x18.4x16.4	ATX	4/0	2/1	300W
479	155	7.9x18.4x16.4	ATX	4/0	2/1	300W
480	195	7.8x18x16.5	ATX	4/0	2/1	300W
482B	80	7.8x19.8x17.5	ATX	4/0	2/2	250W
486	67	9.6x19.5x17	ATX	4/0	2/1	250W
489**	80	7.3x17x17	ATX	3/0	1/2	235W
490	70	8.5x15.5x15	ATX	2/0	2/2	250W
491B	70	8.5x15.5x15	ATX	2/0	2/2	250W
496	60	8.25x17.8x16.5	ATX	4/0	1/3	250W
501	155	8.25x17.2x23.8	ATX	4/0	2/4	300W
503R/B	455	14.8x20.4x18.4	ATX	8/0	2/4	300RW
503/B	295	14.8x20.4x18.4	ATX	8/0	2/4	300W
505	555	14.6x23x26.8	ATX	12/0	1/8	300W
505R	670	14.6x23x26.8	ATX	12/0	1/8	300RW
506/R	155/370	7.8x16.5x24.4	ATX	6/0	2/2	300W/R
524	380	13.9x25.6x19.1	ATX	7/0	1/2	300RW
526B/W	105/120	7.5x17.5x24.5	ATX	6/0	1/4	250W/300W
528	95/110	7.5x16.5x24.8	ATX	6/0	1/5	250W/300W
536	93/108	7.8x17x24	ATX	5/0	1/5	250W/300W
538	290	8x20.5x24.5	ATX	5/0	1/6	300RW
560/R	290/445	15x24.5x23.5	ATX	11/0	2/4	300W/300R
562/R/B/W	250/470	8.7x17.9x26.8	ATX	9/1	1/0	300W/300R
563/RB/W	145/370	8.7x17.9x26.8	ATX	10/0		300W/300R
565	185	9.25x18.3x21.2	XEON/ATX	4/0	2/4	300W
568	95/110	7.5x17x22.8	ATX	5/0	2/4	250W/300W
569B/W	210	13.5x17.8x14	B/ATX	6/2	0/8	300W/300W
570/R	150/370	8.3x17.3x26.4	ATX	7/1	1/2	300W/300R
571/R	160/370	8.3x17.3x26.4	ATX	6/1	1/2	300W/300R
582	105/120	7.8x16.5x23.2	ATX	6/0	2/1	250W/300W
588	99/114	7.8x16.5x23.3	ATX	5/0	1/3	250W/300W
1620/R	950	16.5x20.3x34.3	F/ATXx2	16/0		300R

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2 for Desktop Case
3 for Mini-Mid Case
4 for Mid Case
5 for Full/File Server Case
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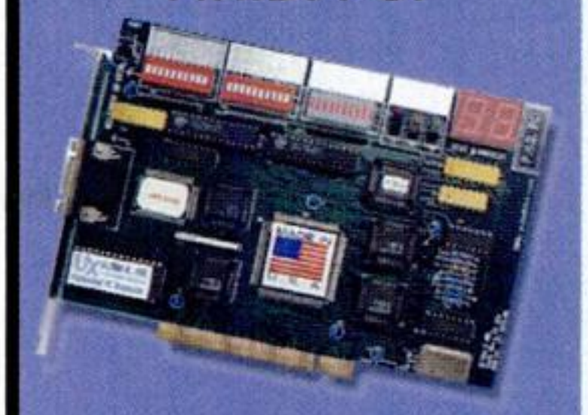

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1 August 2001

E-BOOK SYSTEMS

MAXIMUMPC Rig of the Month

THIS MONTH: Ryan Scavone's Gooey Chillinator

OK, this water-cooled medusa isn't really called the Gooey Chillinator, and 16-year-old Ryan Scavone doesn't really use his cooling emulsion as emergency hair gel, even though the liquid does indeed dry into "waxy goo," as Ryan confided. No, we just took it upon ourselves to give Scavone's rig a goofy nickname—because photos of his PC have brought such joy to our otherwise humdrum lives.

Here's how CPU watercooling, Scavone-style, works: The water pump (the black box with the copper heatsink) pushes cool water to the water block, which is attached to the CPU. The water block draws heat away from the CPU and transfers it to the water inside the block. This newly heated water then shoots back up to the radiator (the jobbie with the copper coils), which cools the water and sends it on over to the reservoir (Mrs. Scavone's prized Tupperware). The cooled water is then shot on over to the water pump, where the cycle starts anew.

If you have a contender for Rig of the Month, e-mail **input@maximumpc.com** with pics and a brief write-up.

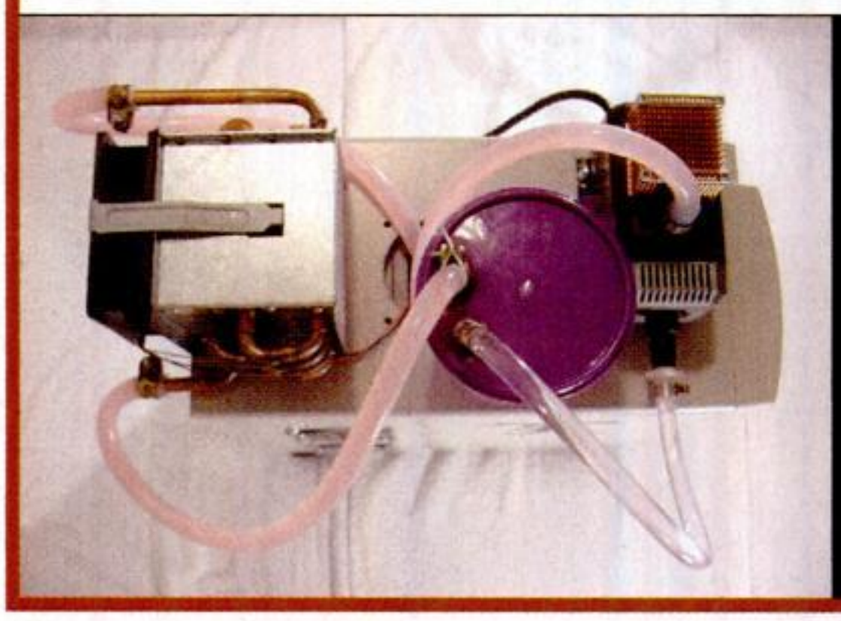
MPC: Is it really water? Why is it pink?
Scavone: Yes, it's water, and it's pink because I stuck "water wetter" in it. This improves the thermal conductivity of the water, minimizes mineralization to prevent parts corrosion, and minimizes the "battery effect," so that the water doesn't pick up its own charge.

MPC: What do you think would happen if you drank the water?
Scavone: I'd get really bad cramps.

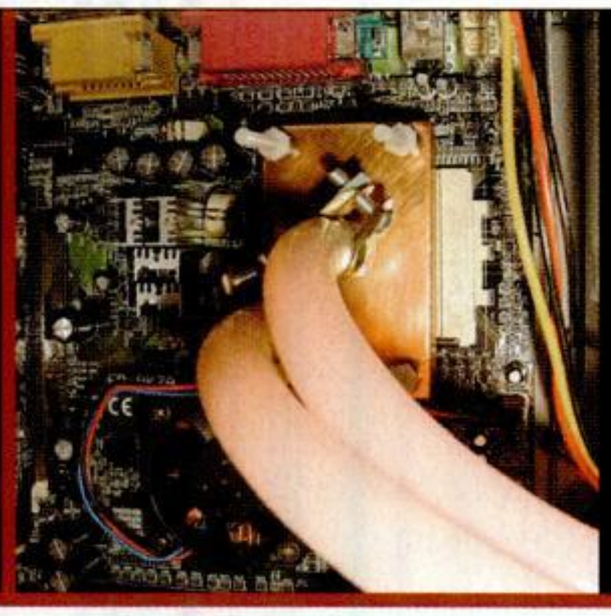
MPC: Any CPU advice for the folks at home?
Scavone: I've actually made some great changes to my setup since I first built it. I put in one of those new 1GHz AYHJAR Thunderbirds to replace my old 1.1GHz AVHA-stepped Thunderbird. This thing is amazing. It does 1.61GHz (134MHz x 12) fully stable, and would do more, I think, if my BIOS didn't think the 12.5 multiplier setting was 13. Still, a 61 percent overclock for $105 is sweet!

MPC: What's next for Ryan Scavone?
Scavone: Maybe I can get my hands on some major peltiers and build a water bong.

MPC: Come again!?
Scavone: It's an evaporative cooler that takes the place of the radiator and can cool the water below room temperature.
MPC: *Right.* Mum's the word.



MPC: Where did you buy the parts?
Scavone: Most came from dangerden.com. They're pretty much known as the best water-cooling place around. I added the reservoir myself. I think my mom got the idea of what I was going to do with it when I began sizing up the stuff in the kitchen cabinet... Now, people who see my rig think it's a heart-lung machine.



Scavone's water block affixes directly to a 1GHz Thunderbird Athlon via four regular heatsink screws. With water-cooling active, Scavone runs the T-Bird to 1.6GHz with utmost reliability. The proc sits inside an EPoX 8K7A motherboard that's home to 256MB of Crucial PC2100 DDR, and a 3D Prophet 2 GTS (GeForce2) that's been OC'ed to 220/207MHz.

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